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SELF-ACTING
AIR-PUMP VENTILATORS

Are pronounced by the Highest Authorities in the Kingdom to be the most efficient in existence.

They create a continuous extraction of the foul air, are entirely free from down draught, have no mechanical movement, cannot get out of order, require no attention, and there is no after cost.

"Since these excellent Ventilators have been introduced we have now got *perfect* methods of ventilation."—Dr. B. W. RICHARDSON, F.R.S.

From the late SIR GILBERT SCOTT, Architect.

"I have used your Patent Self-acting Air-pump Ventilators with complete success, and will always have great pleasure in recommending them."

From SIR WILLIAM THOMSON, F.R.S.

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£50 Prize (only Prize offered), International Ventilation Competition, London, May, 1882.
Silver Medal (Highest Prize), Eastbourne Sanitary Exhibition, August, 1881.
First Prize (only one awarded to Roof Ventilators), International Medical and Sanitary Exhibition, London, July and August, 1881.

"Messrs. Boyle's Patent Air-pump Ventilators have now established themselves beyond a doubt as the nearest to perfection of anything of the kind before us."—*Architect.*

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Ventilating, Sanitary, & Consulting Engineers,

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TO WHICH

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OF

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HAS BEEN RECENTLY APPLIED:—

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EFFICIENCY.
ECONOMY.

EFFICIENT
VENTILATION
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Admirality.
Horse Guards.
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Imperial Mint, St. Petersburg.
Caius College, Cambridge.
Spurgeon's New College.
Claremont, residence of His Royal Highness Prince Leopold.
New Royal Courts of Justice Chambers.
German Athenæum Club.
Portland Prison.
Stoneyhurst College.
Gaiety Theatre, Strand.
Westminster Schools.
Princess Theatre, Manchester.
Royal Naval College, Greenwich Hospital.
New Grand Theatre, Islington.
Royal Aquarium, Yarmouth.
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Normanhurst Court, Battle, seat of Sir Thomas Brassey.
Ashburnham House, Westminster.
New Hall of the Medical Society of London.
Christ's Hospital (Blue Coat Boys).
German Hospital
New Police Station, Shepherd's Bush.
New Police Station, Hornsey.
Law Courts, Salisbury; and the
New Naval Barracks, Keyham, Portsmouth.

Besides several thousand Public Institutions, Churches, Halls, Hospitals, Noblemen's Mansions, Colleges, Schools, Clubs, Dwelling-Houses, Offices, Public Works, Barracks, &c.

The above system was adjudged the Victor at the International Ventilation Competition, London, 1882, *and awarded the Prize of* £50. *It also gained the Gold Medal, London,* 1882, *and the Highest and only Prize at the Hygienic Exhibition, London, June,* 1883.

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ROBERT BOYLE & SON,

Ventilating, Sanitary, & Consulting Engineers,

64, Holborn Viaduct, London; & 110, Bothwell Street, Glasgow.

THE

ARCHITECTS' & CONTRACTORS' HANDBOOK

AND

ILLUSTRATED CATALOGUE

OF

MATERIALS AND MANUFACTURES.

Edited by

J. DOUGLASS MATHEWS, ARCHITECT,

Fellow of the Royal Institute of British Architects, District Surveyor for Stoke Newington, etc., etc.

PUBLISHED ANNUALLY.

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PREFACE.

THE facilities afforded for the transit of materials in the raw and manufactured state, and the rapid strides made by science in recent years, have placed within reach of the Architect and Builder an immense variety of materials and appliances for the construction and adornment of buildings, and the convenience and health of the inmates. A great difficulty has been experienced in bringing them under the notice of those mostly interested in, or able to use them. The plan of issuing circulars has been largely adopted by Manufacturers and others; but the fact of their being so numerous causes them, if not immediately required, to be frequently thrown aside or destroyed and forgotten.

With a view to bring the producer and the user together, THE ARCHITECTS' AND CONTRACTORS' HANDBOOK has been published, with the particulars arranged in a classified form; and for the purpose of recording recent inventions and manufactures, as well as to keep advertisers before their patrons, a fresh edition will be issued each year.

To *Architects and Surveyors* the book will be useful in enabling them to compare manufactures of a similar description, and by giving facilities to obtain the name and address of the firm from whom further information may be gained, if required.

To *Builders and Contractors* the fact of knowing where to ascertain full particulars will be a great saving of time and expense in priceing an estimate, or in ordering articles specified.

To *Manufacturers and Merchants* it will be especially valuable in affording them a means of bringing their goods under the immediate eye of those whose patronage they seek, in a way that no indiscriminate advertising will effect, and, in enlarging the Advertisement Appendix, the general description by means of drawings and list of prices.

To the *Public*, although not a book of general interest, yet to those engaged or taking pleasure in building, the advantage of being able to glance at the many varieties of manufactures and materials will be appreciated.

The objects kept in view are as follows:—To place the book into the hands of those for whom it will be most useful—which is accomplished by issuing it gratuitously to all the members of the Royal Institute of British Architects, and Central Association of Master Builders, comprising the chief Architects and Builders in the Kingdom: to classify the several items in such a way as to be easy of reference, aided by a copious Index of Articles, and the Makers or Importers thereof: to describe the manufactures so that a general idea may be given, without any expression or bias from the Editor, leaving it to the Manufacturer to give fuller information in the Advertisement Appendix.

Although means have been taken to carry out the foregoing in the present issue, it will be easily understood that, as the scheme of the work is entirely novel, great difficulty has been experienced in procuring the particulars required. The plan adopted has been to epitomize, as far as possible, the descriptions contained in circulars, and to send the proof to the proprietor for approval. In some cases no return has been made, and in others, where particulars were wanting, they have not been supplied; and this will account for many omissions, and must be pleaded as an excuse for imperfections. But it is anticipated that when the object of the work is known these difficulties will be overcome, so that next edition will be much more complete. To this end the Editor earnestly begs Architects, Surveyors, Contractors, and others, especially those resident out of the Metropolis, to kindly furnish him with any information as to materials and manufactures that are not now included. He will also be glad to receive any suggestions before the next year, so that the book may be of greater value as a reference for all Architects and Contractors.

The Editor thinks it right to add that the efficiency of the items described, are the statements of the manufacturer or inventor, and that he is not responsible for them.

11, DOWGATE HILL, E.C.,
August, 1883.

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Manserghs Trap	Doulton & Co.	14	
Marezzo Marble	Marezzo Marble Company	22	
Mediæval Ironmongery	Hart, Son, Peard & Co.	38	105
Mosaics	Venice Glass Mosaic Company	92	
Ditto, Mischiato Pavement	Simpson & Sons	23	119
Ditto, Paving	J. F. Ebner	23	
Ditto, Wood	A. McKenzie & Co.	28	

		Description Page.	Advertisement Page.
Neapolitan Tiles	G. Trollope & Sons	6	
Opercular Channels	O. D. Ward	11	100
Ornamental Bricks	Eastwood	2	
Paint, Anti-corrosive	Szerelmey & Co.	89	
Ditto, Albissima	Albissima Paint Company	89	
Ditto, Sanitary	Griffiths, Berdoe & Co.	89	118
Ditto, Silicate	Ditto	89	118
Ditto, Enamel	Ditto	89	118
Ditto, Stone Liquid Encaustic	Szerelmey & Co.	88	
Ditto, Fire-proof	United Asbestos Company	89	118
Ditto, Anti-corrosive	H. Thompson & Co.	90	
Ditto, Luminous	Ihlee & Horne	90	
Ditto, Cleaner and Remover	Wilson & Co.	90	
Ditto ditto	Rendle Brothers	90	
Pan Closet Flushes	J. Tylor & Sons	69	115
Panic Door	R. Adams	26	End cover
Paper-hangings	Cotterell Brothers	90	117
Ditto	C. Hindley & Sons	91	
Ditto	Scott, Cuthbetson & Co.	91	
Ditto	W. B. Simpson & Sons	91	119
Ditto	W. Woollams & Co.	91	118
Parquet Floors	Maple & Co.	29	
Ditto	J. F. Ebner	29	
Ditto	Steinitz	29	104
Ditto	A. J. Arrowsmith	29	
Ditto	Eberhard & Co.	29	
Pavement Lights	W. Brass, jun.	41	End cover
Ditto	Hayward Brothers & Eckstein	42	108
Ditto	T. Hyatt	42	facing p. 1
Ditto, Wood	Wood Pavement Company	28	
Paving Asphalte	R. L. Lowe	5	
Ditto	Val-de-Travers Company	5	
Ditto, Silicate	Pilkington & Co.	6	97
Ditto, Stable	St. Pancras Iron Company	7	112
Ditto, Marble	J. and H. Patteson	23	
Ditto, Mosaic	J. F. Ebner	23	
Ditto, ditto	W. B. Simpson & Sons	23	119
Paving Granite, Artificial	Taylor	21	
Ditto, Silicated Stone	Homan	21	
Pennant Stone	Mangotsfield Stone Company	20	102
Pethers Bricks	Burham Brick Company	2	
Petrifying Liquid	Griffiths, Berdoe & Co.	9	118
Petroleum Stoves	Silber Light Company	62	
Photo-Lithography	Whiteman & Bass	95	
Pipes, Encased Tin	Lead-encased Tin Company	64	
Ditto, Joints	Meadow Foundry Company	11	
Plastering, Rapid System	Hitchins	24	104
Pneumatic Bells	G. Porter	45	
Portable Structures	Puggaard & Galschiodt	93	
Potters' Concrete Slabs	W. H. Lascelles	4	96
Pott's Sewer Trap	J. Cliff & Sons	13	
Pumps	J. Tylor & Sons	64	115
Purifier	Jeyes Sanitary Company	93	
Rainwater Separator	Roberts	11	

		Description Page.	Advertisement Page.
Ranges, Cooking	W. Poore & Co.	53	
Reversible Window	R. Adams	27	End cover
Revolving Partitions	Stone & Co.	28	
Ridge Tiles, Ventilating	H. Thompson	24	
Rock Concrete Tubes	Bowes, Scott & Read	11	
Rolled Iron Girders	Homan & Rodgers	38	107
Roof Principals, Iron	Howitt	40	
Roofing Asphalte	Claridge & Co.	5	
Ditto ditto	Pilkington & Co.	97	
Ditto Felt	Croggon & Co.	31	
Ditto	Ellis & Co.	31	
Ditto, Paper, etc.	Willesden Paper Company	31	
Safety Valves	J. Warner & Sons	67	
Sash Chains	C. J. Harcourt	34	
Ditto, Fastener	Tonks & Sons	35	106
Ditto	E. C. & J. Keay	35	
Ditto	Hobbs, Hart & Co.	35	105
Ditto	J. F. Meakin	35	107
Ditto	R. Adams	35	End cover
Ditto	Verity Brothers	36	104
Ditto, Pulley	J. F. Meakin	34	107
Ditto, Opener	Hart, Son, Peard & Co.	36	105
Ditto, Lever	T. Elsley	37	
Sashes, Swinging	Verity Brothers	27	
Ditto, Iron	H. Mobbs	41	111
Ditto	St. Pancras Iron Company	41	112
Sashline Holder	J. F. Meakin	34	107
School Desks	School Furnishing Company	30	
Ditto, Furniture	Ditto	29	
Ditto	Sidebotham & Co.	30	
Sequoia Wood	A. E. Roberts	26	
Sewage Regulator	Stone & Co.	12	
Sewer Traps	J. Dodd	13	
Ditto, Potts	J. Cliff & Sons	13	
Ditto, Weaver	J. Stiff & Sons	13	98
Ditto, Ventilators	A. Williams	14	
Ditto	Brooke & Sons	14	
Ditto, Mansergh	Doulton & Co.	14	
Ditto, Bower	J. Warner & Sons	14	
Shutters, Revolving	Francis & Co.	30	
Ditto	Salmon, Barnes & Co.	30	
Silicate Cotton	Jones & Co.	32	
Silicated Stone	Imperial Stone Company	21	
Sinks	G. Jennings	67	99
Ditto	J. M. Craig	8	101
Skylights	Braby & Co.	64	
Slates	Whitland Abbey Company	23	
Slate Ridge	J. Thomas & Sons	23	
Slag-pressed Bricks	Cleveland Slag Company	1	
Slag Wool	Jones & Co.	32	
Sleeper Blocks	G. Jennings	8	99
Slop Sinks	J. Tylor & Sons	68	115
Ditto	Stidder & Co.	68	
Smoke Exhauster	F. Braby & Co.	86	
Smoke and Ventilating Flues	G. Jennings	7	99
Ditto ditto Pipes	Boyd	87, 81	

		Description Page.	Advertisement Page.
Spring Hinges	R. Adams	32	End cover
Stair Treads	W. H. Lindsay & Co.	26	
Ditto	J. Westwood, jun.	26	
Stoneware Rain and Soil Pipes	G. Jennings	8	99
Stones—			
Bolton Wood	T. Wood & Co.	19	
Hollington	Taylor & Bettany	19	
Grinshill	Bridge and Cureton Quarry Company	19	
Pennant	Mangotsfield Stone Company	20	102
Red Corsehill	J. & A. Murray	19	
Scotgate Ash	Trickett & Son	19	
Spinkwell	T. Wood & Co.	19	
Tisbury	Wardour Company	20	
Doulting	C. Trask	20	102
Bath	Stone Brothers	20	102
Stoves—			
Armstrong	Ashton & Green	46	
Bartlet	Barnards & Bishop	46	
Controlled Combustion	Coalbrook Dale Company	46	110
General	H. Mobbs & Co.	46	111
Grate Splays	Coalbrook Dale Company	46	110
Coking Box	Engert	47	98
Coal Economizer	H. Thompson	48	
Bivalve Gas and Coke	G. Wright & Co.	49	
Comet	Morgan & Wade	49	
Hospital	Adams & Sons	49	
Hygiastic	D. O. Boyd	49	
American	W. Poore & Co.	51	
Calorigen	J. F. Farwig	51	114
Coil Grate	W. & S. Deards	54	
Imperial	Teuten & Robottom	48	113
Kaio Kapnos	Clark, Bunnett & Co.	47	
Kyrle	Coalbrook Dale Company	51	110
Kensington	Brown & Green	47	113
Manchester	E. H. Shorland	50	
Merivale	Hardy & Podmore	50	
Nautilus	J. T. Petter	52	
Pierce's Fire Lump	T. Elsley	50	
Princess Louise	E. H. Shorland	50	
Pyro Pneumatic	T. Elsley	52	
Radiating	Doulton & Co.	52	
Save-all-Waste	Coalbrook Dale Company	50	110
Siemen's Gas and Coke	Waddell & Main	47	
Slow Combustion	W. Corbitt & Co.	48	
Smoke Consuming	Benham & Sons	48	
Syphon Action	Doulton & Co.	51	
Tortoise	Brangwin & Co.	52	
Ventilating	F. Edwards & Son	49	
Ventilating School	D. O. Boyd	50	
Waverley	Wells & Co.	48	
Wharncliffe	Steel & Garland	48	
Sunburners	Hodge & Co.	59	
Ditto	Strode & Co.	59	
Sun Blinds	J. Lowther & Co.	30	
Syenitic Stone	Heathern Brick Company	21	
Swedish Doors	J. Sandell & Co.	26	

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Taps, Self-closing	Collinge Engineering Works	66	
Tar, Carbonized	Haacke & Co.	9	
Taylor's Paving Tiles	Broomhall Company	6	
Terra-cotta	Blanchard & Co.	4	
Ditto	Watcombe Company	5	
Ditto	J. Stiff & Sons	4	98
Terra Metallic Bricks	Wood & Ivery	1	
Tiles	Broomhall Tile Company	24	
Ditto, Facing	Broomhall Tile Company	4	
Ditto, Paving	Broomhall Brick & Tile Company	6	
Ditto, Cement	A. McLean & Co.	25	
Ditto, Encaustic	Maw & Co.	6	
Ditto, Glazed	J. Cliff & Sons	3	
Ditto, Neapolitan	Trollope & Sons	6	
Ditto, Paving	Chaffers	6	
Ditto, Roofing	J. Matthews	23	
Ditto, ditto	C. O. Philips	24	103
Timber Preservation	Burnett	25	
Time Locks	Dalton Syndicate	95	
Tisbury Stone	Wardour & Tibury Stone Company	20	
Traps, Disconnector	Stiff and Sons	15	98
Ditto, Sewage Gas	W. P. Buchan	13	101
Ditto, Sewer	Banner & Co.	13	101
Ditto, Sewer	J. & M. Craig	13	101
Ditto, Sewer	Stiff & Sons	14	98
Ditto, Stoneware	Dent & Hellyer	15	
Ditto, Flushing	Ingham & Sons	15	
Ditto, Syphon	Ingham & Sons	15	
Ditto, Tidal	Stidder & Co.	15	
Ditto, Lead	Dent & Hellyer	64	
Trough Closet and Urinal	Bowes, Scott & Read	74	
Valves, Ball	J. Gregory	65	
Ditto	O. D. Ward	65	100
Ditto	J. Tylor & Sons	65	115
Ditto, Bath and Lavatory	G. Farmiloe & Sons	65	
Ditto, Inlet	R. H. Hughes	66	
Ventilating and Smoke Flue Pipes	G. Jennings	7	99
Ditto	D. O. Boyd	81	
Ventilator, Sherringham's	Hayward Brothers & Eckstein	78	108
Ventilators	W. P. Buchan	82	116
Ditto	T. B. Charlesworth	84	
Ditto	Hill & Hey	80	120
Ditto, Boyles	Comyn, Ching & Co.	82	
Ditto, Exhaust	General Ventilating Company	83	116
Ditto, Roof	C. Kite & Co.	83	
Ditto, Roof	General Ventilating Company	79	116
Ditto, Downcast	Boyle & Son	80	Ft. cover.
Ditto, Syphon	Lawson & Hainsworth	81	
Victoria Stone	Victoria Stone Company	22	
Vitrified Damp Course	Broomhall Tile Company	7	
Ditto	G. Jennings	7	99
Ditto	Stiff & Sons	7	98
Urinals	Brazier & Son	74	114
Ditto	J. Tylor & Sons	67	115
Ditto	Stidder & Co.	74	

		Description Page.	Advertisement Page.
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Urinettes	Stidder & Co.	74	
Walls, Concrete	J. Tall	3	
Ditto ditto	J. C. Sellars	4	
Ditto ditto Slabs	W. H. Lascelles	4	96
Washhouse and Bath Fittings	Bradford & Co.	42	107
Water Bars	R. Adams	36	
Water Closets	G. Jennings	70	99
Ditto	Tylor & Sons	70	
Ditto	Warner & Son	70	
Ditto	Bolding & Sons	71	
Ditto	Capper, Son & Co.	71	
Ditto	Dent & Hellyer	71	
Ditto	D. T. Bostel	71	
Ditto	Stidder & Co.	71	
Ditto	Brazier & Son	72	114
Ditto	Brown & Son	72	
Ditto	J. Dodd	72	
Ditto	O. D. Ward	72	100
Ditto	T. Gregory	72	
Ditto	W. T. White & Co.	73	
Ditto	Woodward	73	
Ditto Ventilation	E. Howard	77	
Waterproofing Solution	Szerelmey & Co.	10	
Water Pressure Reducer	T. Lambert & Sons	66	
Waterproof Wall Lining	W. White	9	96
Water-Waste Indicator	R. H. Hughes	66	
Water-Waste Preventers	Lambert & Sons	74	
Ditto ditto	O. D. Ward	74	100
Ditto ditto	T. Lambert & Sons	75	
Ditto ditto	G. Farmiloe & Sons	75	
Ditto ditto	Hayward, Tyler & Co.	75	
Ditto ditto	J. Tylor & Sons	75	
Ditto ditto	Brazier & Sons	76	114
Ditto ditto	C. Winn & Co.	76	116
Ditto ditto	H. Braithwaite & Co.	76	
Ditto ditto	O. D. Ward	76	100
Ditto ditto	Pontifex & Wood	76	
Ditto ditto	Antiseptic Company	77	
Ditto ditto	H. Conolly	77	
Ditto ditto	T. H. P. Dennis	77	
Water Meter	J. Tylor & Sons	66	
Weaver's Sewer Trap	J. Stiff & Sons	13	98
Windows, Air-tight	Howard	27	
Ditto, ditto	G. Trollope & Sons	27	
Ditto Reversible	R. Adams	27	End cover
Ditto Opener	C. Beard	37	
Ditto Wrought-iron	General Iron Company	41	109
Wood Block Flooring	T. Gregory	28	
Ditto Mosaic	A. McKenzie & Co.	28	
Ditto Carving	Martin's Patent Company	92	
Ditto Decoration	Pliable Decoration Company	92	
Zinc, Roofing	F. Braby & Co.	63	
Ditto, Roof Light	Ditto	64	

THADDEUS HYATT,

PATENT LENS LIGHT WORKS,

9, FARRINGDON ROAD, (NEAR CHARTER-HOUSE STREET), LONDON, E.C.

HYATT'S LENS LIGHTS,

For Pavements, Floors, Roofs, Stallboards, &c., &c.

HYATT'S

LENS LIGHTS COMBINED WITH REFLECTORS,

By which means the greatest possible amount of light is obtained, and by which method the Light can be directed to any part of the Basement.

HYATT'S PRISMATIC LIGHTS.

HYATT'S PATENT SAFE WALKING,

STONE FACE ILLUMINATING GRATINGS.

HYATT'S PATENT

LENS LIGHTS WITH TILE INLAYS.

HYATT'S

Illuminating & Ventilating COAL HOLE PLATES.

INFRINGERS WILL BE PROSECUTED.

Samples of the above Lights may be seen, and all information obtained, by applying to the office of HYATT'S PATENT LENS LIGHTS, as above.

THE

ARCHITECTS' & CONTRACTORS' HANDBOOK

AND

ILLUSTRATED CATALOGUE

OF

MATERIALS AND MANUFACTURES.

BRICKLAYER.

The Patent Dredger, Excavator, and Elevator.

PRIESTMAN BROTHERS, 52, *Queen Victoria Street, E.C.; and Hull.*

This machine has large self-filling and discharging scoops or buckets, with the necessary engine power. The engines work on cast-iron foundations, with vertical boilers. The machine is in use amongst railway and other large contractors for excavating, ballast-filling, etc., and also for lifting and working clay for brickmaking, or as ordinary cranes.

Bricks.

WROTHAM BRICK AND TILE WORKS, *Kent.*

This firm manufactures machine-moulded loam red bricks, which are hard, and absorb but little moisture. Also hand-moulded red bricks and tiles. *See Advertisement Appendix, page* 96.

Slag Pressed Bricks.

CLEVELAND SLAG WORKING COMPANY, *Dock Gate Works, Middlesbrough.*

These bricks are manufactured from the slag from iron furnaces. They are red in colour, uniform in size, lighter than ordinary red bricks, and being tough, are injured but little in transit. They will stand a considerable crushing strain.

Terra Metallic Bricks, etc.

WOOD & IVERY, LIMITED, *Albion Blue Brick and Tile Works, West Bromwich.*

This firm manufactures ornamental string-courses, also pier caps, trusses, vases, mouldings and steps, and staircases, either blue, brindled, red, white, buff, or other colours desired. Compressed brindled bricks are also made, which are capable of sustaining considerable weight, and are unaffected by the atmosphere.

Moulded and Ornamental Bricks.

James Brown, *Broad Street Buildings, Liverpool Street, E.C., and Braintree, Essex.*

These bricks are made similar in quality and colour to the best red and white Suffolk facing bricks, and include moulded bricks of all kinds, suitable for plinths, strings, cornices, etc.; also enriched bricks of various sizes, for strings, panels, diapers, window jambs, copings, terrace walls, and chimneys.

Ornamental Bricks.—White and Red Suffolk Enfaced Bricks.

J. & W. Eastwood, *Belvedere Road, Lambeth, S.E.*

Ornamental patterns are worked on the face of the bricks, but only two moulded bricks are used as header and stretcher to describe the pattern. They are inexpensive and easily laid.

Ornamental Brickwork.—Pether's Patent.

The Burham Brick, Lime, and Cement Company, Limited,
7, *Nicholas Lane, E.C.*

The bricks made by this firm are of gault clay, in yellow and red colours, and of the usual brick size, to bond in with ordinary work. The ornament is in low relief, and effective for diaper work, and for strings, cornices, bands, etc. Special vousson bricks are made for arches, and also bricks for panels, pilasters, etc., and provide an economical and effective means of ornamentation.

Beaded Bricks for Garden Walls.—Foxley's Patent.

F. Rosher & Co., *Old Jamaica Wharf, Upper Ground Street, S.E.*

These bricks are made of the usual size, but with a beaded face in which are perforations. The beading furnishes a protection against spring frosts, and prevents cold draughts, and the perforations allow of string or wire passing through them, for trailing branches, creepers, etc.

Glazed Bricks.

The bricks are made in white and several colours, such as buff, brown, sage green, red, black, blue, green, etc., and as headers and stretchers. Ornamental bricks are made for dados or string cornices, and moulded bricks to suit designs.

Joseph Cliff & Sons, *Wortley, near Leeds.*
J. & M. Craig, *Kilmarnock.*
The Farnley Iron Company, *near Leeds.*

Glazed Tiles.—Hall's Patent Hanging Tiles.

JOSEPH CLIFF & SONS, *Wortley, near Leeds.*

These tiles are made in a rebated form to allow of laps; the lower part is glazed in white or other colour, and ornamented in relief, if desired. The upper part is unglazed, and has perforations to allow of nails being driven through by which they may be attached to the joints of old brick work, or fixed on to boarding. By this means, the tiles cannot fall off, and are unaffected by frost.

Limes.

Grey Chalk. — Supplied from Halling, Dorking, Lewes, Petersfield, Merstham, etc.

Lias Lime.—Supplied from Barrow, Leicestershire; Lyme Regis, Dorset; Whitby, Yorkshire; Rugby, Warwickshire.

Roman Cement.—Prepared from nodules found in London clay at Harwich and Sheppey.

Medina Cement.—Made from septaria found in Hampshire and Isle of Wight; Whitby or Atkinson's from Whitby, Yorkshire.

Portland Cement.—Chiefly manufactured on the banks of the Thames and Medway.

Patent Selenitic Cement.

21½, *Millbank Street, Westminster.*

This is an improved method of using ordinary quicklime, which by a simple and inexpensive process may be at once converted into cement mortar by mixing with the water a small quantity of sulphate of lime. The advantages claimed are—a cement of double the strength of best ordinary mortar, at no greater cost, and a considerable saving in cement concrete, without loss of strength. For plastering, it is much harder than ordinary plaster, and, by setting almost immediately, it enables work to be followed on at once and finished.

Cement Concrete.—Lowe's Improved Cement Concrete.

ROGER L. LOWE, *Worsley Road, Farnworth, Bolton, near Manchester.*

This material is non-combustible, and suitable for the formation of fire-proof floors and paving, being hard and capable of taking a polish. It is damp-proof and inodorous, and is not affected by heat or cold or any solvent.

Concrete Building.—Patent Improved Concrete Building Machine.

J. TALL, *Lordship Lane, Dulwich, S.E.*

The appliances for building concrete walls, etc., consist of standards about 12-ft. high, and being telescopic, can be raised when desired. To these are bolted panels, on each side, to form trenches into which the concrete is placed. The advantages claimed for this apparatus are its cheapness in first cost, the readiness with which it can be shifted, and the speed with which a building can be erected.

Facing Tiles for Concrete Walling.

BROOMHALL TILE AND BRICK COMPANY, LIMITED, *Cox's Wharf, Upper Ground Street, S.E.*

The tiles are L shape, and similar in appearance and depth to an ordinary brick. They may be used only as an external facing to a concrete wall constructed in the ordinary manner, or by their use inside as well as outside, the concrete can be filled between.

Concrete Slab Walls.—Potter's Patent Dovetail Slabs.

W. H. LASCELLES, 121, *Bunhill Row.*

This patent is for building walls without the usual framework appliances, and to give a finished face without rendering. For this purpose slabs are made of a calcined material, uniform in strength, quality, and texture, of a variety of tints, with a dovetail lug at each end and self-fixing, in slabs 2-ft. long and 9-in. deep, or other sizes. Walls may be built with an internal and external slab, and the intermediate space filled in with Portland cement concrete, or the outside may be of brick. The slabs are non-absorbent, and being carefully cast, internal plastering can be dispensed with.

By the use of this mode of construction a saving is claimed in the cost of a wall over ordinary brickwork, and in addition a better face and resistance to weather. *See Advertisement Appendix, page* 96.

Concrete Walls.—Sellar's New Method of Building.

J. C. SELLARS, 2, *Woodside, Ferry Buildings, Birkenhead.*

This method consists of hollow blocks, 18-in. long × 9-in. high, by the width required for the wall, and set as ordinary walling stones, but the ends being made with a circular joggle, instead of being set close together, there is an open space, equal to about the length of the block, into which a slab, back and front, is dropped down. When fixed, they are filled in with concrete, composed of any suitable material; but as the outer surface is waterproof, and the walls are strongly built with proper bond, the quantity of cement used for the filling the concrete may be a very small proportion, and soft or porous stones may be used. The slabs have the appearance of ordinary ashlaring, or may be made with rustic joints, if desired. The advantages claimed are, that the walls being non-absorbent, a perfectly dry house may be obtained. The even face inside renders plastering unnecessary, and the saving in cost between this and a brick wall is stated to be considerable.

Terra-Cotta.

BLANCHARD, SON, & CO., *Blackfriars Road, London, S.E.*

This firm succeeded the original manufacturers of terra-cotta in England. Arrangements are made that no duplicate of a design furnished will be cast, if so desired. Vases, finials, terminals, fountains, columns, crosses, and all kinds of external decorations are made.

JAMES STIFF & SONS, *High Street, Lambeth, S.E.*

This material being burnt to a great intensity, produces a thoroughly imperishable substance of buff or red colour and good finish.

It is manufactured in springers, terminals, window dressings and ornaments, balusters, copings, cornices, capitals, parapets, air bricks, string-courses, and other ornamental decorations, with the especial purpose of competing with soft stones constantly used for these purposes. *See Advertisement Appendix, page* 98.

THE WATCOMBE TERRA-COTTA COMPANY, LIMITED, *St. Mary Church, near Torquay, Devon.*

The terra-cotta manufactured by this Company is fine in texture and of a beautiful warm tone, and is adapted as well for architectural decoration as for statuettes, busts, vases, and other fine art works.

Polonceau Asphalte.

PILKINGTON & Co., 15, *Fish Street Hill, E.C.*

This asphalte is especially useful for keeping down damp, and for forming floors for basements, warehouses, barns, etc., also for lining walls and damp course. For roadways for heavy traffic a concrete of broken stone and asphalte, 2-inches thick, is formed, finished with 1-inch of pure asphalte.

Pilkington's Seyssel asphalte has the advantage of being elastic, and is especially useful for roofing purposes.

The acid-resisting asphalte is useful for the paving of lavatories, tanks for acids, etc. *See Advertisement Appendix, page* 97.

Improved Asphalting.

ROGER L. LOWE, *Worsley Road, Farnworth, Bolton, near Manchester.*

This asphalte is made from materials produced in this country, and stated to be equal to the Lava asphalte, and much less in cost. It is elastic, but hard, and is adapted for floors, paving, roadways, etc., and also for rendering reservoirs waterproof, at a cost less than puddling.

Asphalte Roofing.

CLARIDGE & Co., *Victoria Embankment, W.C.*

Wood battens are nailed to rafters, about ½-in. apart. A layer of fine lime and hair concrete is then floated over, upon which the asphalte is spread. The weight of concrete and asphalte, ¾-in. thick, is under 15 lbs. to the foot, and is stated to be very strong, and thoroughly effectual to keep out weather.

Patent Asphalte Roofing.

PILKINGTON & Co., 15, *Fish Street Hill, E.C.*

This roof is formed with a coat of Polonceau asphalte, ½-inch thick, on which is laid specially prepared roofing felt, and finished with Seyssel asphalte, ½-inch thick. It is stated that roofs constructed in this manner have stood for 25 years without repair. *See Advertisement Appendix, page* 97.

Asphalte Paving.

THE VAL DE TRAVERS ASPHALTE PAVING COMPANY, LIMITED, *Palmerston Buildings, Old Broad Street, E.C.*

This asphalte can be laid either in a compressed form or in a semi-liquid state. It is well adapted for roadways, foot pavements, stables, cow-houses, corn stores, barns and other floors, as it is perfectly waterproof, and not affected by urine or acid, and is security against vermin. It forms a good covering to roofs. The same firm lay their asphalte as a damp course.

White Silica Paving.

PILKINGTON & CO., 15, *Fish Street Hill, E.C.*

This pure white material is especially suitable for corridors, conservatories, etc. It is laid on a foundation of Polonceau asphalte and is waterproof. *See Advertisement Appendix, page* 97.

Concrete Pavement and Floors.

W. B. WILKINSON & CO., *Newcastle-on-Tyne.*

This material is laid down in a plastic state, and rapidly hardens; is not affected by frost, impervious to damp, and durable. It is used for flooring stables, coach-houses and yards, warehouses, tennis-courts, flat roofs, etc. The thickness varies from ½-in. to 3-in., and laid on broken stones or bricks as a foundation.

Paving Tiles.

BELGIAN TILE & CEMENT COMPANY.—W. CHAFFERS, AGENT, 19, *Fitzroy Square, W.*

These tiles are of cement compressed by steam and indurated by a patented process imitating marble, with inlays of ornamental designs. They are usually made about ten inches square and one thick, but special sizes as well as designs can be made. They are suitable for floors of conservatories, halls, churches, etc., etc.

BROOMHALL BRICK & TILE COMPANY, *Cox's Wharf, Upper Ground Street, Blackfriars, S.E.*

Manufacturers of Taylor's patent paving tiles, in red and white ordinary paving ware, and in red and blue Staffordshire ware, 12 in. by 6 in. Each tile is made with a rebated flange or foot, upon which the next rests, in order to secure a free passage for the circulation of air under the whole floor, and so prevent damp rising.

Encaustic Enamelled and Majolica Tiles—for Pavements and Walls,

MAW & CO., *Broseley, Staffordshire.*

Manufacturers of encaustic and other tiles for pavements of every description for domestic purposes. Also glazed and encaustic tiles of ancient make for church pavements and reredoses—majolica, printed and enamelled faience for walls and ceilings. White and drab glazed tiles for dairies. W. B. Simpson and Sons, London Agents, 100, St. Martin's Lane, London, W.C. *See Advertisement Appendix, page* 115.

Neapolitan Tiles.

G. TROLLOPE & SONS, *Halkin Street West, Belgrave Square, W.*

These encaustic tiles are of the highest class, and include designs in the Italian and French Renaissance, Persian, Hispano, and Italian mauresque, etc. They are rich in colour, and suitable for wall linings and for floors of churches, halls, conservatories, etc.

Stable Paving.

ST. PANCRAS IRON WORK COMPANY, *St. Pancras Road, N.W.*

The patent bricks made by this firm have one longitudinal grove, and are laid diagonally. The drainage passes along the continuous channels, without being arrested by cross grooves, and the channels give good foothold. Wrought-iron open or covered surface gutters collect the liquids and convey them to syphon-trapped pots. *See Advertisement Appendix, page* 112.

Damp Course, Vitrified Stoneware.

G. JENNINGS, *Stangate, S.E.* STIFF & SONS, *Lambeth, S.E.* BROOMHALL TILE COMPANY, *Upper Ground Street, S.E.*

Tiles 1½-in. and 3-in. in thickness and of widths required by the several walls serve the double purpose of preventing the rise of damp and ventilating the under portion of the floors.

Damp Course, Asphalted Felt.

ENGERT & ROLFE, *Three Mills Lane, Bromley-by-Bow, E.*

This material, formed of felt strongly tarred and sanded, is made in sheets 3 feet long, and of the widths required for the several thicknesses of brick walls. *See Advertisement Appendix, page* 98.

Damp Course.—Pure Bitumen.

CALLENDER'S BITUMEN TELEGRAPH AND WATERPROOF COMPANY, LIMITED, 101, *Leadenhall Street, E.C.*

This material is made of pure bitumen prepared in rolls, generally 24-ft. long, and of breadth suitable for all the usual sizes of brickwork. Its pliability prevents its being broken or injured by the settlement of brickwork or other causes, and will bear the heaviest pressure or strain.

Smoke and Ventilating Flue Pipes.

GEORGE JENNINGS, *Stangate, S.E.*

Fire clay flue pipes for lining smoke flues built in brickwork, 9 inch, 10 inch, and 12 inch diameter, either with butt or socketed joints. *See Advertisement Appendix, page* 99.

Smoke and Air Flue Pipes.

DOULTON & CO., *Lambeth.*

In terra-cotta, forming a smoke and ventilating flue combined, but with separate chambers made in 24-inch lengths, and 18 by 14, 14 by 14, 16 by 9, and 14 by 9 inches.

Chimney Pots, etc.—Billing's Terminals.

DOULTON & CO., *Lambeth.*

Terra-cotta pots, sloping at the top so as to reduce the outlet, and enabling the heated smoke to maintain its power the full length of the flue. The external slope increases the ascensional current. A partition between the pots prevents the return of smoke from adjoining chimneys.

Patent "Scientia" Chimney-top.

JAMES STIFF & SONS, *Lambeth, S.E.*

The upper part of this chimney-top, which is of terra-cotta, consists of two horizontal pivot-shaped rings, placed a few inches apart, and forming a contracting entrance or funnel for the wind, the velocity of which is thus increased. Passing rapidly and horizontally between the two rings, the wind drives out the smoke at the expanding exit on the opposite side, causing a stronger updraught in the chimney, and a free delivery of smoke. The shape of the rings is designed to prevent down draught. *See Advertisement Appendix, page* 98.

Sleeper Blocks.

GEORGE JENNINGS, *Poole, Dorset; and Stangate, S.E.*

These blocks are made of earthenware, and sunk on top to carry a 4½ or 9 inch wall or wood sleeper, or arranged to carry stone paving. They are perfectly damp-proof and require no fixing. *See Advertisement Appendix, page* 99.

Stoneware Rain and Soil Pipes.

GEORGE JENNINGS, *Poole, Dorset; and Stangate, S.E.*

These pipes are specially made with iron lugs for angle or flat walls.

White Enamelled Sinks and Wash Tubs.

J. & M. CRAIG, *Kilmarnock.*

Hollow Wall Ties.

CHAMBERS, MONNERY & CO., 41, *Bishopsgate Without, E.C.*

Iron ties for hollow walls are made in cast and wrought iron with the ends forked for building into brickwork, and also in strong galvanized wire. They are so made that moisture cannot be drawn to the inside. *See Advertisement Appendix, page* 98.

Patent Bonding Bricks for Hollow Walls.

GEORGE JENNINGS, *Stangate, S.E.*

These bricks are made of stoneware of such a form that the end which takes the bearing on the inside portion of the wall is bedded one course higher than the other, and being non-absorbent, no water can be drawn inwards. They are made in four sizes to allow of 3-in. or 4½-in. cavity, and for different modes of bonding, and are very strong. *See Advertisement Appendix, page* 99.

The "Hygeian Rock" Building Composition.

WILLIAM WHITE, 3, *Westminster Chambers, Victoria Street, S. W.;*
Abergavenny.

This is a patent preparation for rendering walls perfectly damp-proof, and for increasing their strength. The walls are built up in two thicknesses, with half-an-inch or more between, and the composition poured in a liquid state into the space as the work is built up, which forms a solid wall. It is calculated that a wall of this description will sustain double the weight of an ordinary one. The material sets almost instantaneously, so that walls may be built with great rapidity and perfect security, and papered or decorated almost immediately the plastering is finished.

The composition is adapted for building tanks for water and for cellar walls. *See Advertisement Appendix, page* 96.

Hygeian Rock Impervious Wall Lining.

W. White, 3, *Westminster Chambers, Victoria Street, S. W.;*
and Great Western Works, Abergavenny.

By this lining it is stated that a wall, however wet, can be made permanently dry. It consists of some specially prepared tiles, fixed a little distance from the wall, behind which the waterproofing solution is poured in a hot liquid state, and in cooling fixes and locks the tiles, which may be plastered in the ordinary manner. *See Advertisement Appendix, page* 96.

Patent Carbonized Tar.

A. Haacke & Co., 21, *Lime Street, London, E.C.*

The greatest part of this composition is carbon, which offers resistance to the influence of the atmosphere, moisture, acids, etc. The advantages claimed are that it does not contain any gaseous oils or other substances liable to evaporation or deterioration, and therefore is almost indestructible; and being elastic does not crack, but gives a more durable coating than ordinary gas tar or paint, and is especially suitable for felt roofs. This material also forms a damp course by dipping the bricks in and using the tar instead of mortar.

Callender Damp Resisting Solution.

Callender's Bitumen Telegraph and Waterproof Company, Limited.
101, *Leadenhall Street, E.C.*

This solution coated over new plastering will allow of its being papered or distempered at once. It may also be used in old houses by stripping off the plaster, covering the brickwork, replastering, and coating as before described.

The Crown Damp Resisting Fluid.

T. F. Chambers & Co., *Kensington Works, Hull.*

This preparation is stated to be effectual for preserving, hardening, and indurating stone, brick, cement, etc., of the softest and most pliable description, and is unaffected by the atmosphere. It is supplied in Portland or Bath stone or brick colour, or transparent and colourless.

This same firm manufacture a solution for applying to inside walls, which they state casehardens and waterproofs all inside walls, making them perfectly dry and rendering them lastingly so.

Petrifying Liquid.

Griffiths, Berdoe & Co., 34, *Leadenhall Street, E.C.; and Liverpool.*

By the use of this paint, bricks, cement, stucco, wood, etc., are rendered non-absorbent, and impervious to damp and decay. It is also a remedy for damp walls. *See Advertisement Appendix, page* 118.

Waterproofing Solutions.—Stone Liquid.

SZERELMEY & CO., LIMITED, 110, *Cannon Street, E.C.*

It is stated that this preparation forms a waterproof coating, and renders stone, brick, stucco, cement, tiles, and other porous materials treated with it impervious to rain and moisture, and also arrests decay in stone. It is laid on as ordinary paint, and being prepared in several colours, or transparent, can be applied without injury to the external appearance of a building.

SANITARY MANUFACTURES, ETC.

Stoneware Drain Pipes, etc.

G. JENNINGS, *Stangate, S.E.*
STIFF & SONS, *Lambeth, S.E.*

Drain Pipes, etc.

GEORGE JENNINGS, *Poole, Dorset; and Stangate, S.E.*

The pipes are plain at both ends, not socketed, but laid into stoneware chairs, which are rebated to receive the pipes. When the pipes are properly laid, a cover or saddle piece is fixed on top. The advantages claimed are the impossibility of cement being left to impede the flow of the sewage; the opportunity afforded to properly examine and cleanse the drain; and readiness with which a junction may be made. *See Advertisement Appendix, page* 99.

Buchan's Patent Improved Drain Pipes.

J. & M. CRAIG, *Kilmarnock.*

These pipes are moulded with a block or seat at the faucet end, which allows room for making the joint properly, and prevents the pipes from rolling, and the joints being broken before they are set.

Access pipes are made with openings 18-in. long, which readily allow the admission of a rod or scraper, and facilitate the examination of the drains. The movable cover may be secured with mortar or cement. *See Advertisement Appendix, page* 101.

Lidded Pipes.

DOULTON & CO., *Lambeth, S.E.*

These stoneware socketed pipes may be used at intervals in a drain for inspection or clearing out. The upper part is loose and forms a lid dropping into a rebated joint.

The Patent "Rest" Pipe.

W. INGHAM & SONS, *Wortley, near Leeds.*

Instead of the ordinary socketed pipe, these pipes are made with a wide flange or rest at the bottom of the pipe, which holds up the end of the pipe while the joint is being made under it, so that obstruction in the drain is prevented. A projecting piece at the top of the pipe indicates at once that the drain is properly laid.

Standford's Patent Joints for Sanitary Pipes.

W. INGHAM & SONS, *Wortley, near Leeds; and* 35, *Bucklersbury, E.C.*

The difficulty of obtaining a really water-tight joint to the ordinary drain pipes has led to the introduction of these pipes, by means of which a tight joint is obtained, by casting upon the spigot and in the socket of each pipe, rings of a durable material, which when put together fit mechanically into each other, and yet allow a certain amount of movement or settlement without destroying the accuracy of the joints.

Robbin's Patent Joints.

MEADOW FOUNDRY COMPANY, LIMITED, *Mansfield.*

This patent, which is applicable for sewage, rain water, and ventilating pipes, iron or stoneware, consists in forming a cup or double socket, so that one pipe being flanged may fit into another, which is socketed, and the joint made good with cement. There being no projection on the inside, the waterway is uninterrupted.

Cast-Iron Drain Pipes and Connections.

NORTH BRITISH PLUMBING COMPANY, 4D, *Upper Baker Street, N.W.*

A new system of house drainage introduced by this firm by means of heavy cast-iron pipes, made in 6-ft. lengths, arranged that the joints may be made perfectly air-tight. Also a terminal or dish for cleansing and inspecting the drains, and an air chamber with inlet for main, and two side ditto for branch drains, with an outlet to sewer properly trapped. This system is especially useful where drains have to be carried through a house.

Rock Concrete Tubes.

BOWES, SCOTT & READ, *Broadway Chambers, Westminster, S.W.*

Tubes are made of a heavy concrete, strong and imperishable. There being no projecting socket they bed well, and are useful for sewers, as they permit of a water-tight joint being easily formed. They are cast in various sizes, ranging from 12 inches to 36 inches diameter.

Special Opercular Channels.

O. D. WARD, 182 *and* 183, *Upper Thames Street, E.C.*

These consist of a stoneware trap, self-cleansing—with a moderate flush of water, with an inspection opening for cleaning drain—and an open stoneware channel passing through the disconnecting manhole, with junctions to suit the directions of the branch drains. They also afford an easy means of cleansing. *See Advertisement Appendix, page* 100.

Buck's Patent Rain Water Separator.

ROBERTS, *Haslemere, Surrey.*

The object of this patent is to separate the bad from the good rain water, as until the roofs and gutters are well washed the rain water is foul and unusable. This is effected by an iron box with two compartments, into the first of which the foul water passes and is run to waste, and when a sufficient quantity is thus discharged it allows the remainder to run into the rain water tank. It is self acting and collects leaves, rubbish, etc., which are constantly carried through the rain-water pipe. The separator is made in several sizes to suit the quantity of roofing.

The Patent Self-Acting Sewage Regulator.

STONE & Co., *Deptford.*

The object of this invention is to regulate automatically the quantity of sewage or other liquid which may be applied to land, either for utilization or purification. This is done by the construction of a tank, into which the sewage flows. When the liquid rises to a regulated height it passes through a syphon until the tank is emptied. An interceptor chamber is provided at end of tank, fitted with a strainer, which allows the solid matter to accumulate if desired.

Self-acting Flushing Chamber.

BOWES, SCOTT & READ, *Broadway Chambers, Westminster Square.*

The object of this patent is to produce an automatic means of flushing drains at certain intervals. The chamber is made in galvanized iron, and fitted with Field's Annular Syphon. The water fed from an inlet constantly running rises to the top of the longer limb of the syphon, and, by displacing the air gradually, forming a partial vacuum, is sufficient to start the syphon and empty the tank with great force into the drain to be flushed.

Improved System of Ventilating Soil Pipes, Drains, etc.

BEATTIE, 15, *Holden Terrace, Victoria Street, Pimlico, S.W.*

The soil pipe is extended upwards and through the external wall in a horizontal direction, terminating in a funnel-shaped opening through which the air is drawn. An air pipe is connected with the foot of the soil pipe which is carried up to the ridge of the roof, and terminated by a patent ventilator, thus ensuring a continuous stream of fresh air which is increased each time any of the fittings are used.

Banner's Patent System of Sanitation.

11, *Billiter Square, E.C.*

The objects attained by this system are prevention of sewer gas entering a house, and, by passing air through the soil pipe to ensure cleanliness and freedom from the formation of foul gas. The former is obtained by means of a self-acting trap at the foot of the soil pipe, the use of which dispenses with the need of D or other traps. The soil pipe is secured well into the trap, which is fitted with an air-tight access cover; and at no time is the trap unsealed, and is thoroughly flushed. A small pipe admits air from the outside into the soil pipe above the trap. The soil pipe is carried up to the ridge, or highest part of the roof, and terminated by a Banner patent ventilating cowl formed with a funnel-shaped tube, which being always directed towards the wind, allows of the discharge of the foul air from the soil pipe escaping at the other end, and is assisted by creating a vacuum round the top of soil pipe and ventilator. *See Advertisement Appendix, page* 101.

Banner's Patent Traps.

11, *Billiter Square, E.C.*

These traps are made in iron or earthenware, and have three inlets at the top: one for the soil pipe, another for a ventilating shaft from drain, and a third for inspection or cleaning. By an inlet-pipe at the bottom of the soil-pipe, fresh air is always supplied, which prevents syphonage.

Another form called the Double-dip Trap, is in two divisions, one having a ventilating pipe immediately over the outlet, and the other trapped at the side of the outlet. The bottom of the soil pipe is formed into a D trap. The foul air is allowed a free escape, rather than having to pass through two traps into the house. The inlet in the soil pipe prevents syphonage. *See Advertisement Appendix, page* 101.

Buchan's Patent Ventilating Sewage Gas Trap.

J. & M. Craig, *Kilmarnock.*

A stoneware syphon trap with a vertical dip, and of a form that will quicken the passage of soil into the sewer. A provision is made on the house side of the trap for the admission of fresh air into the drains, and on the other side of the trap a means of clearing out the trap if required, or for ventilating purposes. *See Advertisement Appendix, page* 101.

Pott's Edinburgh Air-Chambered Sewer Trap.

J. Cliff & Sons, *Wortley, near Leeds; and London.*

This trap, which is of earthenware, also serves as a sewer disconnector by an open chamber, covered with a perforated grating open to the air, and, being on the sewer side of the trap, prevents the pressure of gas. The soil passes with a sharp fall into a syphon trap. It is stated that the rush of water takes place so rapidly that no smell arises at any time. The movable gratings allow of the trap being easily cleaned. *See Advertisement Appendix, page* 122.

Dodd's Patent Duplex Stench Trap.

John Dodd, *Cable Street, Liverpool.*

This trap is made in cast iron and arranged to receive the end of soil pipe, also bath, lavatory, or sink wastes, and, being double trapped, prevents any smell from the soil pipe entering the wastes. It has also an opening on the sewer side of traps, and an open surface grid which allows a constant current of air to pass up the soil and ventilating pipe; another grating over the inlet from the wastes provides for surface drainage. *See Advertisement Appendix, page* 121.

Weaver's Ventilating Sewer Air Trap.

J. Stiff & Sons, *Lambeth, S.E.*

A glazed stoneware trap of syphon form, with an opening to allow of a pipe being attached to relieve the pressure of sewer gas in the house drains and fresh air inlet, and made with a broad foot for setting trap level. *See Advertisement Appendix, page* 98.

Interceptor Sewer Air Trap.

J. STIFF & SONS, *Lambeth, S.E.*

A stoneware trap, with an intercepting chamber between the inlet and the oulet (forming a double trap). The intermediate or intercepting chamber is provided with a foul air safety outlet, so that in case the sewer gas should force its way through the first trap, it will escape into the open air rather than into the house. An inlet in the inner chamber allows a current of fresh air to pass through the drains and up the open soil pipe, and a similar opening in the outer chamber, closed with a disc-plate, affords a means of cleansing the drain. *See Advertisement Appendix, page* 98.

The "Bower" Patent Sewer Gas Trap.

JOHN WARNER & SONS, *The Crescent Foundry, Cripplegate, E.C.*

By the construction of this trap the waste pipe from baths, sinks, etc., passes into a cup or receptacle which always contains water, the outlet pipe being at the top. A floating valve or ball effectually prevents any gas from entering the waste pipe, as the weight of the water constantly keeps it closed when not in use. It also serves as a preventive against back water, floods, and wind blowing from the mouth of the sewer.

Patent Sewer Ventilator.

BROOKE & SONS, *Fieldhouse Fire Clay Works, Huddersfield.*

An ordinary drain pipe is fixed from the sewer in a vertical position, into which is fitted a galvanized wire sieve containing charcoal, the gases from the sewer become deodorized, and escape into the open air through the sewer grating. To prevent wet road grit from falling on to the charcoal, a movable cover is fitted, which being lifted allows the charcoal to be renewed, and the sewer to be inspected.

Latham's Patent Sewer Ventilator.

A. WILLIAMS, 64, *Bankside, Southwark, S.E.*

The objects sought to be attained by this ventilator are a simple and effective mode of retaining the deodorizing properties of charcoal, which are lost by saturation, and the removal of dirt and other matters, that arise in a roadway. This is done by means of a casting in two divisions; one having an open grating into which rain and dirt pass, the latter being removable by a portable box, and the other division having a special tray into which charcoal is placed, through which the gas passes before escaping from the sewer into the road.

Mansergh's Improved Gulley Trap.

DOULTON & CO., *Lambeth.*

An earthenware trap with one or more inlets made to suit the size and direction of the drain, and fitted with a movable iron or stoneware cover, which serves the double purpose of allowing the escape of gas into the open air, and also a drain grate. This trap is especially suitable for lavatory, bath or sink wastes.

Patent Triple Dip-Trap, or Waste-Receiver and Drain-Interceptor.

Dent & Hellyer, *Newcastle Street, Strand, W.C.*

A trap of glazed stoneware divided into two compartments, arranged so that the water from one will not pollute the other. The smaller compartment is for the reception of waste-pipes from baths, sinks, etc., and the other for surface drainage, and also to serve as a ventilator. Having three dips it is impossible for sewer gas to pass into the house.

Patent Quick Motion or Flushing Trap.

W. Ingham & Sons, *Wortley, near Leeds.*

This trap is of stoneware of an unusual form, a portion of it being of less bore than the drain for the purpose of increasing the velocity of the water, and so preventing the trap silting up, and to quicken the passage of the sewage into the trap. It is on the sewer side of the ventilator through which the drain is carried in an open channel, at the bottom of the manhole.

Accessible Syphon Trap.—Brown's Patent.

W. Ingham & Sons, *Wortley, near Leeds.*

This trap, which is of glazed stoneware, is made with a flat bottom to ensure a good water seal, and fitted with a loose lid which drops into a socketed joint for access, both to the trap and the drain. A vertical outlet provides means for ventilation on the house side of the trap or for surface water.

Weatherley Disconnector Waste-Water Traps.

J. Stiff & Sons, *Lambeth, S.E.*

This trap serves as a disconnector for house drains, a grease trap, and a yard gulley. The waste-pipes from sinks, baths, etc., are connected with a syphon trap discharging into the receiver, which is covered by a movable open grating, and serves as a ventilator. The outlet-pipe has a considerable dip, forming an effectual trap. Grease will float on top of the water, and may be easily removed by lifting the iron cover. *See Advertisement Appendix, page* 98.

Patent Surface or Drain Tidal Trap.

J. G. Stidder & Co., *Southwark Bridge Road, S.E.*

This trap is made of strong pottery, with iron grating and inspection cover, fitted with a copper valve flap, which is kept effectually closed until the tide abates, and prevents the water passing into the house.

Improved Inspection Gulley.

Broad & Co., *South Wharf, Paddington, W.*

This trap is formed of white enamelled stoneware with inlets if necessary, and galvanized iron cover. Its speciality is a movable cap in the dip slab, which affords an easy means of cleansing and a ready access to the drain.

Bean's Patent Inspection Gulley.

O. D. Ward, 182 *and* 183, *Upper Thames Street, E.C.*

This stoneware gulley is made with rounded angles inside, which prevent the attachment of soil, etc., with an inspection opening for examination of the drain. The cap is made to fit air-tight, by means of an elastic solution, to avoid the breakage frequently occurring when it is cemented in. *See Advertisement Appendix, page* 100.

Hildred's House Drain Traps and Ventilators.

E. Brooke & Sons, *Fieldhouse Fire Clay Works, Huddersfield.*

These traps are made in glazed stoneware, in several forms. One an ordinary syphon with outlet for ventilating pipe. Another of the P form, with an inlet for the soil pipe and an open dish stone over and outlet for ventilation. Other traps of the P and S forms, with open dish stoves to receive waste and outlets for ventilating pipe.

McLandsborough's Self-Cleansing Double-Trapped Ventilating Gulley.

W. Ingham & Sons, *Wortley, near Leeds.*

This trap is of glazed stoneware and consists of three divisions, in one of which are three inlets for rain water or waste-pipes, the centre one a ventilating chamber with opening or grate for ventilating pipe, and the other the outlet to the drain, the divisions forming dips. Any sewer gas passing through the outer trap, escapes into the open air, rather than again passing through the water and up the waste-pipes.

Patent Self-acting Fat Interceptor and Drain Deodorizer.

Brazier & Son, 106, *Blackfriars Road, S.E.*

This patent consists of a tank, either of galvanized iron or wood lined, containing twenty or sixty gallons; in this is a circular vessel receiving the waste from the sink, having at the bottom some prepared lime, which acts as a deodorizer. The fat floats in this receiver, which can be removed for cleaning. The water rising to a certain height is syphoned into the drains, a special means being adopted to prevent any floating grease from entering the pipes. *See Advertisement Appendix, page* 114.

Grease Intercepting Tank.

Dent & Hellyer, *Newcastle Street, Strand, W.C.*

A stoneware tank with an open top, covered with a movable iron slab. The greasy water is discharged a few inches below the level of the standing water in the tank, which is cold. By this means the grease is congealed, and may easily be removed.

Grease Traps.

J. C. Edwards, *Trefynant, Ruabon.*

This trap is of glazed stoneware, and made either single or double. The former is used as a gulley trap with a good water seal, and a receptacle for grease or other matter, which can be readily lifted out. The double trap is especially serviceable for externally trapping house drains. It has two dips with an open gulley grating between them, through which the sewer gas would pass if it succeeded in forcing its way through the one trap. This is also fitted with a receptacle for grease, and, having an iron hooked handle, is easily removed.

GEORGE JENNINGS, *Stangate, S.E.*

This trap is formed of glazed stoneware, with grease chamber, about 16 inches square. The amount of cold water in this chamber immediately chills and solidifies the grease, which may be easily removed by lifting the iron grating at top. The waste water enters the outlet-chamber at so low a level that no fat or floating matter can escape into the drain. *See Advertisement Appendix, page* 99.

J. G. STIDDER & CO., *Southwark Bridge Road, S.E.*

This trap is made in iron to fix under scullery sinks. The waste-pipe is formed as a syphon, and only allows liquid to pass into the drain. The grease is deposited, and may be removed by means of a cleansing-door in front.

This firm also manufactures another grease trap in pottery, to be fixed under scullery sinks, which can easily be cleaned out, and the grease removed.

Dean's Patent.

WARMSLEY & CO., *Reading.*

This earthenware trap is formed with a double dip, the space between having a perforated opening for air. The bottom of the trap is very deep, and forms a receptacle for grease, into which is fitted a movable iron dish with long handle, to allow of easy removal.

Soil Pipe Trap.

DENT & HELLYER, *Newcastle Street, Strand, W.C.*

This trap is of stoneware, with a deep dip and an inlet low down to receive the soil pipe. The upper part is formed with two openings, one to allow of the trap being cleaned out, and the other for ventilating the drain. The advantages claimed are that it intercepts the air in the drain, and being under ground level the water does not evaporate; and that it is a safeguard against sewer gas entering the house.

Drain Ventilators.—Kite's Registered Drain Ventilators.

C. KITE & CO., 117, *Chalton Street, Euston Road, N.W.*

The "Exhaust Ventilator" is made of stout zinc, with gills and screens, so that the air striking upon it in any direction will create a vacuum, and cause a powerful up-draught. The inlet ventilator is made of similar material, funnel-shaped, and used in connection with the exhaust ventilator, supplies a constant current of fresh air for circulation through the drains.

Double-Action System of Soil Pipe Ventilator.

R. BOYLE & SON, 64, *Holborn Viaduct, E.C.*

This system consists of two pipes extending from top to bottom of building, one forming the soil and the other the ventilating pipe. They are connected at top with a double-action upcast and downcast ventilation, and at bottom with a bend so that a complete circuit is established. The use of an air-pump and a down-cast ventilator produces a continuous current always in one direction, and keeping the soil pipe thoroughly ventilated. The downcast ventilator is attached to and forms the bottom of the air-pump ventilator, the divisions being so arranged that an open mouth is always presented to the wind. *See Advertisement on Front Cover.*

The Patent Asphyxiator.

J. WATTS & CO., *Broad Weir Works, Bristol.*

This machine is used for applying the smoke test to drains, and also for disinfecting and fumigating purposes. It consists of a fan working in a combustion chamber in which is placed some lighted sulphur or smoke paper; a flexible tube is attached to a nozzle, and carried where required. The rotation of the fan, by turning a wheel, will force the fumes to almost any distance through the drain. It can also be used for the destruction of rats and vermin in holes.

Patent Manhole Covers and Ventilators for Sewers.

W. BATTEN, C.E., 150, *Lozells Road, Birmingham.*

The constant complaints of sewers being choked by the entry of road sweepings, etc., the need of proper ventilation to the sewers, and the means of easily flushing them have caused the invention of the above, whereby the road waste is retained from falling into the sewers, by two external chambers which receive it, and can be easily removed without opening the cover, or lifting the lid. Provision is made for the egress of sewer gases, and a ready mode adopted for properly flushing and inspecting the sewers. *See Advertisement Appendix, page* 99.

Improved Air-tight Cover for Inspection Pits.

F. BOTTING, 29, *Mount Street, W.*

The purpose of this cover is to form an air-tight chamber, built of brickwork, in which may be placed an intercepting trap between the house drains and the sewer, or as a cover to a fat trap, where frequent inspection is necessary. It can be readily removed, and has no lock or key, but, by means of a rebated flange dropping into a frame, effectually prevents any smell from rising.

MASON.

Granite.

MOUNTSORREL GRANITE COMPANY, LIMITED, *near Loughborough, Leicestershire.*

This is stated to be the only true granite in Leicestershire. The chief products of the quarries are kerbs and channelling, paving setts, randoms, and broken stone for macadam. The small stones and dust are largely used for concrete. Masonry work is also executed.

Bolton Wood Stone.

T. WOOD & Co., *Bradford.*

This stone is of a light, uniform colour, and specially useful for monumental work. There are two kinds, one called white, and the other drab. It may be obtained in large or small blocks or worked to details.

Spink Well and Cliff Wood Stone.

THOMAS WOOD & Co., *Bradford.*

This is fine-grained, hard, and durable sandstone, strong and well adapted for general building, and used for the exterior of the Manchester Town Hall and other places; and is also adapted for hard wear such as steps, landings, etc.

Hollington Stone.

TAYLOR & BELLAMY, *Rocester, near Uttoxeter.*

This is a sandstone obtained in the neighbourhood of Uttoxeter, Staffordshire. It is of a warm colour, easily worked when first quarried, but rapidly hardening on exposure, and much used for building in many of the smoky towns.

Red Corsehill Stone.

J. & A. MURRAY, *Victoria Stone Wharf, Millwall, E.*

This stone quarried at Corsehill, Dumfriesshire, Scotland, is a sandstone of a warm red colour, fine in texture and capable of sustaining great weights, but specially adapted for ornamental work, carving, sculpture, etc., and is a good weather-stone. It also serves for staircases where good appearance and hardness is required.

Grinshill Freestone or Fine-Grained Sandstone.

BRIDGE & CURETON QUARRY Co., *Millwall, E.*

The "White" is a fine-grained white sandstone of a creamy colour, and useful for building and ornamental purposes, being easy to work, but hardening by exposure. The "Yellow" is a little warmer in colour, and useful for general purposes. The "Flag Rock" is manufactured into kerbs, steps, sills, etc. The "Red" quarry is even in texture, a rich red colour, and easily worked.

Scotgate Ash Stone.

TRICKETT & SON, *Millwall, E.*

This stone is quarried at Pateley Bridge, near Leeds. It is a fine-grained sandstone of good colour and very strong, and adapted for usual building purposes, especially for landings, steps, curbs, engine beds, etc. The green craig is of a greenish hue, and forms a good contrast to other stones, and is used by sculptors, etc. The white craig is a very fine-grained stone of superior quality and colour.

Bath Stones.

STONE BROTHERS, *Bath.*

Combe Down Stone.—This stone differs in quality, according to locality. The Lodge Stile Quarries supply a good weather stone of a light colour, free from soft yellow beds. The beds vary in depth from one foot to five feet.

Box Ground Stone.—A good weather stone, of a warm colour; is very sound, and can be obtained in large blocks and in good lengths.

Stoke Ground.—Very similar to Box Ground, but the exceptionally large blocks, both in depth and length, render it very useful.

Corsham Down.—A stone of a fine texture, very sound, and well adapted for carvings, mouldings, and tracery.

Corngrit.—The lower bed of the Corsham Down Quarry. A coarse-grained stone, suitable where strength is required. *See Advertisement Appendix, page* 102.

Doulting Stone.

C. TRASK, *Norton-sub-Hamdon, near Ilminster, Somerset.*

This is a free stone, of a deep cream colour, of superior quality, regular and uniform in texture, and very durable and useful for interior and exterior work. It is capable of sustaining great weights, and is therefore useful as a walling stone. *See Advertisement Appendix, page* 102.

Tisbury Stone.

WARDOUR, (CHILMARK,) & TISBURY STONE COMPANY, LIMITED,
8, *Old Jewry, E.C.*

This stone is identical with the Portland oolites. The beds vary in texture: the upper being a stiff roach, suitable for bed-stones for engines, girders, machinery, etc.; the under beds produce stone of a fine texture, and are adapted for external and internal dressings and general stone work, and readily carved.

Pennant Stone.

MANGOTSFIELD PENNANT STONE COMPANY, LIMITED,
55, *Nicholas Street, Bristol.*

This is a hard and close-grained natural stone of a slaty-blue colour, very hard and durable, and especially useful for steps, landings, paving, kerbing, etc., being nearly as hard as granite, but not wearing slippery. It is also adapted for building and monumental purposes, being readily worked and of good colour, and can be obtained in large blocks. *See Advertisement Appendix, page* 102.

Marble Chimney-pieces.

GENERAL IRON FOUNDRY COMPANY, 41, *Upper Thames Street, E.C.*

Massa Carrara Marble.

THE MASSA CARRARA MARBLE COMPANY, LIMITED, 5, *Idol Lane, Great Tower Street, E.C.*

A white marble, of a hard and close grain, and capable of a high and lasting polish, and specially useful for flooring and steps, dados, etc.

Artificial Granite Paving.

W. J. TAYLOR, 91, *Church Street, Chelsea, S.W.*

This paving is laid in a liquid state on broken brick, stone, or hard refuse of buildings, and, being impervious to moisture, is suitable for underground floors and for stables, paving, etc. It is also made as landings, steps, etc., and being rough forms a good foothold for walking.

Patent Granolithic Manufactures.

STEWART & CO., *Church Row, Limehouse, and Thomas Street, Edinburgh.*

This artificial stone is stated to be very durable and being slightly rough forms a good foothold, and is specially suited for pavements, corridors, courtyards, stairs and landings, etc., and, when grooved, for stables. The material can be manufactured in large slabs.

Silicated Stone Paving.

E. HOMAN, 17, *Gracechurch Street, E.C.*

This paving is composed of Kentish rag and Portland cement, treated with a solution of silicate, and is stated to be strong, durable, and gives a good foothold. It is made in 1-in. and 1½-in. thick, and grooved and channelled when required for stables.

Artificial Stone.

ALLEN'S ARTIFICIAL STONE, *Tabernacle Walk, London, E.C.*

This concrete stone is fire-proof, the components being coke breeze and Portland cement. It is very hard and suitable for steps, landings, sills, lintels, dressings, and outside work of all descriptions. It is also used as concrete in conjunction with rolled iron for fire-proof floors, roofs, etc.

Syenitic Stone.

THE HATHERN STATION BRICK COMPANY, *Loughborough.*

An artificial stone produced by a patented process, resembling rubbed stone and extremely hard and durable, and capable of being made to any moderate size. It is adapted for steps, copings, gate piers, sink stones, street kerbing, ornamental door and window heads, string-courses, piers and architectural decorations generally.

Imperial Stone.

THE IMPERIAL STONE COMPANY, LIMITED, *East Greenwich, S.E.*

An artificial Stone composed of clean crushed granite or Kentish ragstone, or other approved material properly crushed and mixed with Portland cement in a special mill, and placed in a mould which is arranged to vibrate up and down, which tends to consolidate the material, and is further assisted by two men who arrange and smooth the concrete. The moulded material is then placed in a bath or solution of silicate of soda for about a week, which secures induration. It is useful for paving, steps, landings, sinks, kerb and channelling, garden edging, window sills, and other articles, also for sewer pipes.

Ransome's Patent Concrete Stone.

A. H. BATEMAN & CO., LIMITED, *East Greenwich.*

This stone is formed by the admixture of sand, chalk, or other mineral substance, with its proper proportion of a solution of silicate of soda. This is then run into moulds or blocks, and afterwards saturated with a solution of chloride of calcium. The silica combines with the calcium and forms an insoluble silicate of lime, whereby a perfect natural stone is produced. It can be supplied in slabs for painting or for architectural decorations, steps, balustrades, etc. It is hard and will bear a great amount of wear, and stated to resist the influences of the atmosphere in large towns.

Artificial Stones.

PATENT VICTORIA STONE OR PETRIFIED CONCRETE, 283A, *Kingsland Road, N.E.*

This stone is formed of granite and hydraulic cement, steeped by a patent process in a solution of flint, which makes it nearly as tough as granite, becoming hardened by time and unaffected by the atmosphere. It has been extensively used for flagging footways, kerbs, etc., and is also made as window-sills, palisade and wall-copings, steps, sinks, cisterns, etc., and for architectural dressings.

Marezzo Marble.

1 & 2, *Great Winchester Buildings, E.C.*

An imitation marble made of cement in which fibre is interwoven. Being very hard it takes a good polish, and resembles foreign marbles both in colour and brilliancy. It can be made of any size or form such as columns, pedestals, pilasters, chimney-columns, pedestals, balustrades, etc.; chimney-pieces, and fenders.

Artificial Marbles.—Patent Mycenian Marbles.

J. B. FOXWELL, 340, *Upper Street, Islington, N.*

This material is made to imitate all varieties of marble, and is said to be capable of being dressed and polished equal to marble. It is prepared in slabs or panels for wall decorations, dados, etc.; mouldings, chimney-pieces and fenders; columns, pilasters, etc.

Marble Mosaic Concrete.

W. BENNISON & SON, *Hulme, Manchester.*

The material is composed of small pieces of marble of one or many colours made in slabs or tiles and similar in appearance to Roman mosaic It is adapted for floor pavements, wall-linings, and hearths, and may be laid by ordinary workmen.

Mosaic Paving.

Jos. F. Ebner, *Clerkenwell Road, E.C.*

This paving consists of marble or other tesseræ prepared in London, and laid on a concrete foundation by Italian workmen, bedded in mastic, and afterwards rubbed and polished to a perfect and even surface, and of any approved design.

Mosaic Mischiato Pavements.

W. B. Simpson & Sons, 100, *St. Martin's Lane, W.C.*

Roman Mosaic Floor; Mischiato, and other kinds for Halls, Churches, Public Buildings, etc., in all styles, laid by experienced workmen. *See Advertisement Appendix, page* 120.

Marble Mosaic Tiles.

J. & H. Patteson, *Oxford Street, Manchester.*

These tiles are made of small pieces from various coloured marbles, mixed with a specially prepared cement, and similar in appearance to Italian mosaics. They are of several shapes, as square, octagon, or hexagon; also ornamental borders.

The material is suitable for dado lining, etc., and made in large slabs also for steps, landings, hearths, columns, chimney-pieces, etc., and capable of taking a high polish if desired.

Stone Fonts, Pulpits, etc.

Jones & Willis, *Euston Road, N.W., and Birmingham.*

TILER AND SLATER.

Roofing Slates.

Whitland Abbey Green Slate Quarries, *Llandisillio, Narberth.*

A green slate of pleasant tint, hard, durable, and economical.

Eureka Green Slates.

Roberts, Adlard & Co., 18, *Little Tower Street, E.C.*

Bangor Patent Slate Ridge.

J. Thomas & Son, *Bangor, N. Wales.*

This ridge has the advantage over the usual ridges by being sawn with a flange, which is clipped by the roll and thus rendered water-tight.

Roofing Tiles.—Poole's Patent Bonding Roll Tiles.

J. Matthews, *Royal Pottery, Weston-super-Mare.*

These tiles have rolls or corrugations on their faces, and made to lap and bond. The advantages claimed are—great strength, lightness, perfect security against rain, and no liability to stripping by wind.

Taylor's Patent Roofing Tiles.

BROOMHALL TILE AND BRICK COMPANY, *Cox's Wharf, Upper Ground Street, S.E.*

These tiles are made in shades of red, white, dull red, dun, etc. Each tile is flanged at edge, and every alternate course forms a cover. In appearance the roofs show a number of channels. They are made with 3½-in. lap, and are about the same weight as slates, and each tile is nailed.

Patent Lock-Jaw Roofing Tiles.

CHARLES D. PHILLIPS, *Newport, Monmouth.*

These tiles interlock with each other and form a perfect joint on each of the four sides, from the nature of which snow or rain cannot penetrate. They are made in two different styles, called the single and double grip, and in three colours, red, dun, and glazed, as required; and as these tiles in the process of manufacture undergo a pressure of forty tons they are practically non-porous. *See Advertisement Appendix, page* 103.

Patent Ventilating Ridge Tile.

H. THOMPSON, C.E., 22, *Victoria Buildings, Deansgate, Manchester.*

This ridge tile is made in Terra Cotta and Blue Staffordshire Ware of several ornamental designs, so arranged as to form vents from the roof with hooded covers. The heated air from rooms, warehouses, etc., is conducted by flues in the walls into the roof above the ceiling joists, and escapes by means of the openings in the ridge. It is said that there can be no down draught, as the space in the roof would break the force of the wind.

PLASTERER.

Hitchins' Patent Plastering.

St. Mark's Place, Sandringham Road, Dalston, E.

This invention consists of forming the base of ceilings with slabs in lieu of the ordinary lath, lime, and hair: the advantages of which are great speed, cleanliness, durability, lightness, and provision against fire. Another invention is Hitchins' fire and sound resisting ceilings and floors. This consists of fastening wire netting to the under edge of the joists. A carbonic composition is then filled in between the joists upon a centre so as to adhere to the wire netting. Slabs of the same composition are fixed upon fillets close under the floor boards, which prevent the joists from catching fire. *See Advertisement Appendix, page* 104.

Ornamental Ceiling Enrichments.

THE PAPIER-MACHE COMPANY, LIMITED, 21, *Wellington Street, Strand, W.C.*

The advantages claimed for papier-mâché and fibrous plaster over ordinary enrichments are in their design, the ease, saving of time, and cleanliness in fixing, and their use, if desired, as ventilators. The manufactures comprise ceiling flowers, cornices, enriched panels, etc.

Hard Cements, etc.

A. McLean & Co., *Canterbury Wharf*, 69, *Belvedere Road*, *Lambeth*, *S.E.*

Manufacturers of non-effervescent, Keen's, and Parian cement; also of stone cement, which can be dragged as real stone. It can also be manufactured into chimney-pieces and ornamental cast work.

Patent Embossed and Plain Tiles.

A. McLean & Co., 69, *Belvedere Road*, *Lambeth*, *S.E.*

These tiles or slabs are made of non-efflorescent Keen's cement, stamped under heavy pressure, with an embossed pattern on the face. They are adapted for wall-linings and other decorative surfaces, and being very hard and non-absorbent will stand hard wear, can be easily cleaned and admit of any decoration required.

CARPENTER AND JOINER.

Joiners' Machinery.

A. Ransome & Co., 304, *King's Road*, *Chelsea*, *S.W.*

This firm devotes itself to the production of machinery, to perform all the work necessary for the manufacture of joiners' work, commencing with the circular saw and finishing with the glass paper. By the use of this machinery it is asserted English joiners' work can be manufactured for less than the imported Swedish doors.

Registered Portable Carpenters' Bench.

T. J. Syer, 1, *Finsbury Street*, *E.C.*

The advantages of this bench are, that, being on metal supports and firmly bolted, it cannot rack and get loose at the joints. It is fitted with the standard instantaneous grip vice and the patent bench knife for holding the wood during the process of planing and rebating. *See Advertisement Appendix, page* 104.

The "Joiner's" Bench Knife.

Salmon Barnes & Co., *Ulverstone.*

This patent bench knife consists of an iron plate affixed where desired to the bench, to which is attached a lever handle, acting upon a cranked arm, for holding the work firmly between itself and the bench hook. It is small and light in weight.

Preservation of Timber, etc.

Sir W. Burnett & Co., 90, *Cannon Street*, *E.C.*

This preparation hardens and improves wood, preserves it from the adherence of animal and vegetable parasites, and from wet and dry rot. It also renders it *un*inflammable if desired, and in any case *less* inflammable than in its ordinary state. All descriptions of soft wood are rendered hard and durable.

Timber Preservation.

Bethell's Process.—The air is extracted from the pores of the wood, and creosote at a warm temperature is forced in under high pressure.

Kyyau's Process.—This consists of an injection of corrosive sublimate (bichloride of mercury).

Boucherie's Process.—A tank containing a solution of sulphate of copper is placed at a sufficient height and allowed to force its way through the fibres of the wood.

Gardner's Process.—This is done by dissolving the sap and injecting a chemical preparation, which also renders the timber uninflammable.

Fancy Woods.—Sequoia.

A. E. ROBERTS, IMPORTER, 18, *Fenchurch Street, E.C.*

This wood has the warm tone of cedar, without its overpowering odour. It is of varied figure and applicable to ornate work in ecclesiastical and domestic furniture, and for interior panelling and furniture.

American Joinery.

BRADLEY & CURRIER, 23 & 24, *Old Bailey, E.C.*; *and* 54 & 56, *Dey Street, New York.*

The brands of this firm are a cross, a diamond, and a star, distinguishing the quality of the timber. The cross signifies timber with a few sound knots, or a little dry sap; the diamond, the same in a smaller degree; and the star, selected timber entirely free from defects. All the doors are equally well made of American pine, thoroughly seasoned, well glued and dried.

Swedish Doors.

J. SANDELL & CO., *Waterloo Bridge Road, S.E.*

This firm recommends the doors imported by them for the superiority of workmanship, and wood, and their dryness, as no door is made from wood that has not been cut out and stuck for at least eighteen months before being worked.

The Panic Door.

R. ADAMS, 7, *Great Dover Street, S.E.*

This invention is to insure instant egress from public buildings, in the event of fire or panic, and consists of a vertical sliding counterpoised door which ascends into a prepared recess immediately a handle is turned at the side of the door inside, and also on the outside, if desired. The handle is covered by a glass door which can either be opened or broken to allow of its use. *See Advertisement Appendix on Back Cover.*

Patent Reversible Treads and Landings.

W. H. LINDSAY & CO., *Paddington Iron Works*, 14, *South Wharf Road, W.*

These treads are made of jarrow, teak, oak, or other approved hard wood cubes, fitted into iron frames in small panels, which may be reversed from back to front, or side to side, or turned over when worn. They can be fitted to existing stone, iron, or wood staircases, or used in the construction of new staircases.

Hawkesley's Patent Treads.

J. Westwood, Jun., *London Yard Iron Works, Isle of Dogs, Poplar, E.*

These steps are formed of oak cubes with the grain upwards, fixed into an iron frame, giving a firm and safe footing; and are recommended for durability and noiselessness. They can be used in an ordinary wood or iron staircase, or laid on a new or worn-down stone staircase.

Patent Anti-Accident Reversible and Sliding Window.

R. Adams, 7, *Great Dover Street, S.E.*

By this patent the outside of the sashes can be easily revolved or inclined into the room for cleaning, etc. It can be adapted to existing sashes and frames by removing the front and parting bends and inserting tongues in the sash stiles. Pivots allow of the sash being turned in a horizontal position when released by a key. *See Advertisement Appendix on Back Cover.*

Brother's Patent Air-tight and Burglar-proof Safety Sashes.

George Trollope & Sons, *Halkin Street, Belgrave Square, W.*

The sashes combine the advantages of an ordinary hung sash and casement, and may be opened wide for cleaning or for ventilation in the usual way. They must be opened only from the inside and may be locked if desired. An additional system of ventilation is provided at the head of the frames. By means of grooves closing over India-rubber tubes, the entrance of draught is prevented.

Bullivant's Air-tight and Noiseless Sliding Sash Windows.

E. Howard, 34, *Upper Gloucester Place, N.W.*

The objects sought to be attained by this patent are freedom from draught and rattling, ease in cleaning, and prevention of damage by broken sash lines. These are accomplished by a guide-bar tongued into the sash which works in a groove in the pulley style, and to which the weights are attached. This is easily removed and allows the sashes to be taken out for cleaning without the necessity of removing and refixing beads. By the use of grooved rollers on a screwed axle the ordinary pulley is dispensed with, and much wear and tear avoided.

Patent Compound Sliding and Swinging Sashes.

Verity Bros., 12, *Call Lane, Leeds.*

This firm manufactures sashes and frames in red deal, oak, mahogany, and pitch pine, fitted with chain opener and lock-bolt fastener. They are arranged to lift as ordinary sashes, and the upper or lower sash made to swing on pivots for ventilation or cleaning. *See Advertisement Appendix, page* 104.

Revolving or Movable Partitions for Excluding Sound.

STONE'S PATENT REVOLVING SHUTTER WORKS, *Ure Mills, Ulverston.*

The object of this patent is to afford means of communication when desired between rooms in schools, public buildings, dwelling houses, etc., at the same time to prevent transmission of sound when the rooms are divided. This is done by means of revolving horizontal and vertical partitions or shutters, formed with inodorous dry hair felt or other non-conducting fabrics encased with wood, or iron laths, or steel plates. Sliding partitions are made in a similar manner to fold in recesses.

Wood Chimney-pieces.

BARNARD, BISHOP & BARNARDS, *Norfolk Iron Works, Norwich; and* 91, 93 & 95, *Queen Victoria Street, London, E.C.*

Manufacturers of ornamental chimney-pieces in deal, pitch, pine, wainscot, or American walnut, with mirrors, embossed leather, Japanese lacquers and tile panels, and especially suited to the slow combustion stoves manufactured by this firm.

Wood Pavements.

THE IMPROVED WOOD PAVEMENT COMPANY, 46, *Queen Victoria Street, E.C.*

This street paving consists of Baltic red wood blocks, prepared in creosote laid on concrete, about ⅜-in. apart, into which is run hot bituminous mastic as grouting.

This system of paving is adapted for stable yards, playgrounds, etc. The blocks for these purposes are not so deep as those used for street paving, and may be laid with asphalte.

White's Wood Block Flooring.

THOMAS GREGORY, *Meyrick Road, Clapham Junction, S. W.*

This floor consists of wood blocks, wrought or unwrought, well-seasoned and Burnetized, and laid on concrete in plain or fancy patterns. It is not liable to the ravages of dry rot or vermin. Dry and warm to the feet, and firm to the tread, free from noise, and specially adapted for schools, churches, or other public buildings, and as a covering for fire-proof floors.

Wood Mosaic Flooring.

A. MCKENZIE & CO., 87 & 89, *Buchanan Street, Glasgow.*

Manufacturers of parquet or wood mosaic flooring and paving, dados, etc. The originality of this mode consists in the flooring being made in triple cross laminations, and, having end as well as side wood at every joint, renders shrinking or opening at the joints impossible, as thoroughly seasoned woods are used, which are chiefly oak and walnut, but fancy woods are also available.

Diachromatised Wood Pavement.

H. E. WEBB, *The Tileries, Worcester.*

This invention consists in ornamenting blocks of wood from half to one and a half inches thick, with ornamental patterns similar to ordinary tiles.

The pattern (which may be in colours) is forced entirely through the wood, "endwise grain," by hydropneumatic pressure, so that although the wood may wear down the design is not obliterated. Another adaptation is the ornamentation of panel work, door furniture, etc.

Parquet Flooring.

C. STEINITZ, *London Parquetry Works*, 45, *Grove Lane, Camberwell; and* 18, *Old Quebec Street, W.*

The manufacture of parquetry was first introduced into Great Britain by this firm, in 1841. It confines itself to English made work of the highest quality, but without restriction as to design. The system of manufacture is that known as "mounted," the foundation consisting of a solid clamped panel, and the surface being equal in thickness to the available substance (above the groove) of solid parquetry. *See Advertisement Appendix, page* 104.

EBERHARD & Co., 8, *Edward Street, Hampstead Road, N.W.*

The patent possessed by this firm is to facilitate the fixing of parquet flooring of any thickness on an old floor or stairs without the use of pins or packing, and renders levelling unnecessary. The squares of parquet, being pressed into a waterproof glue or cement, may be laid on stone or concrete floors and stone staircases without any other fixing than the patent composition glue.

Hungarian Parquet Floors.

J. F. EBNER, *Clerkenwell Road, E.C.*

The material employed in these floors is Hungarian oak, which undergoes a process of desiccation previous to use. The wood is chiefly 1-in. thick, and may be laid either herring-bone, in battens 3-in. to 4½-in. wide, tongued together, or in designs more elaborated, and with ornamental borders in various woods.

Patent Hydrofuges Parquet.

MAPLE & Co., *Tottenham Court Road, W.*

This recently invented parquet is prepared with a backing composed of concrete, tile, and asphalte, so arranged that it can be laid direct on the soil without fear of injury by damp. It is fire and water proof, and may be used as a fire-proof floor over brick arches, etc.

Church Fittings.

JONES & WILLIS, *Euston Road, N.W., and Birmingham.*

School Furniture.

NORTH OF ENGLAND SCHOOL FURNISHING COMPANY (LIMITED), *Darlington.*

Manufacturers of the Westminster bench, in pitch pine, and cast-iron standards, forming a table or desk; the Eastern Counties convertible school desk forming a backed seat and table; the girl's desk with top to fold; reversible backed seats for Sunday schools; single and dual desks, teacher's desks and tables, easels, black boards, and school furniture. Also the Sandon wrought-iron hat and cloak hook which is unbreakable, and the church-pew hat hook on a similar principle. The portable galleries form, when folded, a movable platform.

Glendenning's Patent "Adjustable" Modern Desk.

NORTH OF ENGLAND SCHOOL FURNISHING COMPANY (LIMITED), *Darlington.*

This desk is mechanically arranged, to be raised or lowered as required, so that the pupil is fitted with a desk which can be adjusted to his growth, and may be brought as close to the eye as required. Attached is a chair with a carefully shaped back and support to the feet, which secures a comfortable and healthy position of the body, free from strain and unnatural distribution of weight.

School Furniture.—National Convertible Desk.

SIDEBOTHAM & CO., 27, *Blackfriars Street, Manchester.*

The advantages of this patent are that the desk being hinged it can be made to fall to form a back to the seat, and by placing two of them together and fixing them horizontally they form a table, rendering them useful for other than school purposes.

Revolving Shutters.

FRANCIS & CO., 174, *Gray's Inn Road, W.C.*

The new patent reversible, revolving, and self-coiling shutters are adapted for bay-windows and private residences, and have a neat appearance, both sides being alike.

This firm also manufacture all kinds of revolving shutters in wood and iron with the requisite gearing, and self-acting curvilinear iron and steel corrugated shutters, which latter are fire-proof and thief-proof.

Revolving Shutters.

SALMON, BARNES, & CO., *Ulverston, Lancashire.*

The revolving iron and wood shutters are worked either by springs or patent balance motion. By the latter, the shutters being equally balanced hang perpendicularly in the grooves, and there is but little friction. The wood shutters are fastened with bands of copper, steel, and webbing combined, and the iron shutters with wrought-iron hinges.

Sun Blinds.—The Helio-Scene Sun Blind.

J. LOWTHER & CO., 38 *&* 40, *South Lambeth Road, Vauxhall.*

This blind is formed by a number of hoods which allow a view between each of them, and afford a free admission of air and light at all levels. It is light in construction, durable in use, and ornamental in appearance.

Blind Manufacturers.

HART, SON, PEARD & CO., *Wych Street, W.C.*

Window Blind of the Period.

HODGKINSON & CLARKE, *Canada Works*, *Small Heath*, *Birmingham.*

This blind is similar to the ordinary Venetian blind, but the laths are of corrugated metal. The advantages claimed are that it does not occupy more than half the space of a wood blind, is much lighter, the paint is unaffected by the sun, and fire-proof.

Roofing Felt.

CROGGON & CO., 200, *Upper Thames Street*, *E.C.*

Asphalted roofing felt for covering sheds, farm buildings, etc., and for lining granaries and stores. It is impervious to rain, snow, and frost; light and elastic; and a non-conductor of heat. Made in rolls 25 yards long and 32 inches wide.

Inodorous Felt.

This felt is saturated with waterproof materials, free from offensive smell and adapted to lay on roofs under slates and tiles, as being a non-conductor it prevents excess of heat and cold, and laid under floors deadens sound.

Roofing Felt, etc.

WILLESDEN WATERPROOF PAPER AND CANVAS COMPANY,
Willesden Junction, N.W.

This paper is so prepared as to be water, weather, rot, and vermin-proof. It is made in rolls 54-in. wide and very light, and may be used as a covering for sheds and buildings, not of a permanent nature, by nailing it to rafters about 2-ft. apart, with wood battens to cover the joints.

The paper may also be used for outdoor protection of all kinds, where iron or felt are now used; also for interior decoration, wall linings, partition screens, etc.; and for laying under slates instead of felt, and under floor boards to prevent dust. It is also made in the form of tubes, either to contain water or for protecting lead or iron pipes from frost.

Roofing Felt.

ELLIS & CO., *Strand Street*, *Liverpool.*

In addition to the ordinary dry hair and tarred felts, this firm supplies an inodorous felt, made with resin instead of pitch and tar.

Asbestos Felt and Millboard.

THE UNITED ASBESTOS COMPANY, LIMITED, 161, *Queen Victoria Street*, *E.C.*

These materials are manufactured with Asbestos in their composition, by which they are rendered fireproof. The felt may be used for roofing purposes, and the millboard for lining wooden structures. It is made in sheets, and readily fixed with nails in the ordinary manner. *See Advertisement Appendix, page* 119.

Patent British Made Silicate Cotton (Slag Wool).

F. Jones & Co., *Perren Street, Ryland Road, Kentish Town, N. W.*

In the manufacture of this article which is made from blast furnace slag, the threads or fibres are so blown that the air spaces are angular in shape and small in size; by this means a resistance is afforded to the passage of rarified air, and sound waves are destroyed. It thus becomes a good non-conductor of heat, cold, and sound, and is useful for covering hot and cold water-pipes, tanks and cisterns, pugging to floors, lining to walls, and for arresting the spread of fire. It is made in sheets, and readily fixed, and also into a kind of cement for application to boilers, pipes, etc.

IRONMONGER.

Door and Gate Hinges and Fastenings.

St. Pancras Iron Wors, N.W.

R. Adams, 7, *Great Dover Street, S.E.*

Adjustable Spring Hinges.

R. Adams, 7, *Great Dover Street, S.E.*

The special advantages claimed for this spring are, that the hinge box is of such a shape that two wedges of hard wood effectually fix it, and secures it for moving round in wear. Its strength can be regulated to suit all doors, and easily tightened if required; but as the spring is compensating and has direct action on the axis it is unlikely that slackness will take place, and also that there is but little friction in working. An adjustable shoe allows the hinge to be easily fixed. *See Advertisement on Back Cover.*

Door Springs.

Smith & Turner, 50, *Bartholomew Close, E.C.*

The advantages claimed for the double-action door springs are that they may be regulated to work light or heavy doors. The bearing parts are arranged to produce little or no friction, and by the spring being only a quarter wound up allows free and easy action.

Patent Door Spring and Slam Check Combined.

R. Adams, 7, *Great Dover Street, S.E.*

These springs close the door and prevent it slamming. They can be regulated to hold it open at any angle and also to close to any desired point. They are made in malleable iron and in polished brass. *See Advertisement on Back Cover.*

Braggin's Patent Adjustable Gate Hinge.

Fish Street, Banbury.

The top hinge is cranked to cover the rail and style of the gate, to each of which it is fixed with screws. In case of the posts giving way, by turning a nut it will raise the gate point clear of the ground.

The swing bottom hinge prevents the gate being left open and from being lifted or thrown off its hangings, and the latch can be regulated to drop into the catch when the gate has ceased to swing to and fro.

Door Springs and Shutter Ironmongery.

HART, SON, PEARD & CO., *Wych Street, W.C.*

Locks.

HOBBS, HART & CO., 76, *Cheapside, E.C.*

The locks made by this firm include every description from the drawer to the most complicated lock for safes or bankers' doors. It is claimed that the iron and manufacture being of the best description, the locks are able to stand hard wear, and in the highest class of locks are unpickable.

Door Locks and Furniture.

HART, SON, PEARD & CO., *Wych Street, W.C.*

Hill's Improved Rim and Mortice Locks and Imperial Furniture.

37, *Upper Thames Street, E.C.*

The advantages claimed for the rim locks are superiority of design over ordinary locks, sharp angles avoided, and greater security and durability ensured by triple bolted action. The mortice locks are smaller than the ordinary ones, preventing the cutting away of tenons and weakening the doors.

The furniture consists of a collar which covers the screw of the handle to the spindle and prevents its moving. It is easily fixed and may be adapted to other locks.

Patent Compound Action Locks and Latches.

J. WALKER, 11, *Edmund Street, Birmingham.*
R. ADAMS, 7, *Great Dover Street, S.E.*

The spindles of these locks are placed in the inner corner of the lock to allow of as great a leverage as possible, and being fitted with a compound spring the least turn of the knob or pressure of the finger will cause the door to open. They are made to suit right or left handed doors. An arrangement of a solid collar to the spindle prevents the knob from shaking loosely on the door.

Locks.

YALE LOCK MANUFACTURING COMPANY, 3, *Adelaide Street, Strand, W.C.*

This lock, which is of American manufacture, is based upon an arrangement of notches and springs, and is stated to be unpickable. No two locks are made alike. The keys are unlike ordinary ones, being flat and resembling a saw. The simplicity of the construction prevents the locks from getting out of order. The same firm manufactures a time lock, operated by a chronometer, which allows the lock to be opened or shut only at a time desired.

Patent Lock Furniture.

NETTLEFOLD & SONS, 52, *High Holborn, W.C.*

The spindle is secured into the knob which is attached to the door by the covering rose, so that it cannot be pulled off or loosened, and by both knobs being attached to the spindle strength is secured.

Russel's Patent "Binate" or Non-Separate Door Knobs.

ARCHIBALD SMITH & STEVENS, 48, *Leicester Square, W.C.*

This invention consists of a pair of handles or knobs in one piece keyed on to the door by the insertion of the lock. It is impossible to loosen or detach them except by taking out the lock. The handles are made of ornamental woods, china, glass, and brass.

Patent "Hold-fast" Lock Knobs.

T. H. P. DENNIS, 20, *High Street, Chelmsford.*

The spindle of the lock is tapped with a screw thread at each end in the direction of its length. The knobs are also tapped in the centre of their outer end with the same screw thread as the spindle; they are secured thereto by a uniting screw which passes the knob and engages into the screw-thread of the spindle.

Sash Chains.

C. J. HARCOURT, 74, *Lozells Road, Birmingham.*

These chains are manufactured in stout zinc and copper, and put together with hardened gun-metal rivets. Being very strongly made and both metals unaffected by damp, they are well adapted for heavy sashes, shutters, etc.

Tubular Sash Line Holder.

J. F. MEAKIN & Co., 84, *Baker Street, Portman Square, W.*

The sash line is secured into a sheet-iron tube folded with a projecting rib, which is grooved into the sash stile, and secured by a transverse screw-pin. The lines can thus be easily disconnected from the sash, either to shorten or renew them, without taking the sash from the frame. *See Advertisement Appendix, page* 107.

Meakin's New Patent Solid Frame Sash Pulley.

MEAKIN & Co., 12, *Long Lane, Aldersgate Street, E.C.*

These pulleys are made with hard gun-metal axles (with large bearing surfaces), running in a frame cast in one piece for strength. Small holes in the face-plate allow oil to be supplied direct to the axles without removal, and are not liable to be choked with dust as formerly. Recommended for durability and ease of working under heavy sashes. *See Advertisement Appendix, page* 107.

Patent Triumph Self-acting and Adjustable Sash Fastener.

R. ADAMS, 7, *Great Dover Street, S.E.*

This sash fastener cannot be opened from without, it locks the sashes securely and prevents rattling. It will fasten sashes slightly open for ventilation, and indicates when the window is not fastened. *See Advertisement on Back Cover.*

Sorby's Patent Conservative Sash Fastener.

HOBBS, HART & CO., 76, *Cheapside, E.C.*

This fastener consists of a spring latch fixed on the meeting rail of sash at one side of the window, fitted with a bolt to shoot into two or more notches; the upper one to fix the sashes open for ventilation, and the lower one for securing the sashes when closed. The bolt is drawn back by a rod or cord on the inside within reach, and cannot be opened from the outside. It is capable of being worked at any height from the floor; and, combined with the use of suitable cords, for lowering and closing the upper sash

The "Secure" Self-acting Sash Fastener.

E. C. & J. KEAY, *Corporation Street, Birmingham*

The advantages of this fastener are that a window cannot be closed without fastening, and cannot be opened from the outside. A knob is drawn down into a slot, which, turning a bolt, draws the sashes closely together.

Patent Self-acting Sash Fastener and Opener.

J. F. MEAKIN, 84, *Baker Street, W.; and* 12, *Long Lane, E.C.*

This patent provides for the convenient opening and closing of large windows, and automatically secures them when closed, or when left a little open for ventilation. Especially useful where the meeting rails are above reach, and the ordinary fastener therefore useless.

This sash-fastener is fixed on the top rail of the lower sash, and locks into a rack-plate screwed to the stile of the top sash. A pair of fine cords working over pulleys in the head of the sash-frame, and fitted with suitable handles, are attached to the upper sash to raise and lower it, and one of these cords, passing through the fastener, unlocks it before the sash can be drawn down. The use of long-arms and hook-poles, etc., is avoided. *See Advertisement Appendix, page* 107.

Sash and Casement Fittings.

R. ADAMS, 7, *Great Dover Street, S.E.*

HART, SON, PEARD & CO., *Wych Street, W.*

VERITY BROS., *Call Lane, Leeds.*

Hopkinson's Patent Guarded Lever Sash Fasteners.

W. TONKS & SONS, *Birmingham.*

This sash-fastener being provided with a strong brass guard prevents it being opened from the outside. It is on the same principle as the ordinary sash-fastener, but more effectual in tightening the sashes when closed. *See Advertisement Appendix, page* 106.

Patent Baffle Lock Bolt Window Fastener.

VERITY BROTHERS, *Call Lane, Leeds.*

This fastener is fixed at the side of the sash. One bolt is thrown into the sash and the other into the window frame. A force applied to the bottom sash causes it to bind faster, and it is therefore a security against any attempt to open the window from without. *See Advertisement Appendix, page* 104.

McGill's Slide Rod Sash Opener and Fastener.

HART, SON, PEARD & CO., *Wych Street, W.C.*

This apparatus is for opening and closing top sashes of high and wide windows, and consists of sliding rods attached to the stop beads of windows and regulated by a handle within reach. It also fastens both top and bottom sashes, and cannot be released from the outside. *See Advertisement Appendix, page* 105.

Wedge Casement Stay.

W. TONKS & SONS, *Birmingham.*

An ordinary casement stay of wrought iron, strongly made, and being of wedge shape, when fastened down, it is perfectly secure. *See Advertisement Appendix, page* 106.

Patent Casement Stays.

VERITY BROS., 12, *Call Lane, Leeds.*

This stay is designed for French or casement windows, opening outwards or inwards, which by turning a screw will fasten the window in any position. It is made in cast and malleable iron, electro-nickel plated and polished brass. *See Advertisement Appendix, page* 105.

Water Bars and Bolts for Casements.

R. ADAMS, 7, *Great Dover Street, S.E.*

This water bar is self-acting, and is so constructed that in opening the casement the bar falls, and in closing it rises, and shutting against the iron water bar in the sill renders the casement weather-tight. The espagniolette bolts have a latch in the centre, and with one turn of the handle the casement is secured top and bottom and in centre. *See Advertisement on Back Cover.*

Patent Self-Locking Casement Sash Fastener.

VERITY BROS., 12, *Call Lane, Leeds.*

An iron bar or bolt is fixed in a groove in the shutting style of casement to throw up and down by a cranked handle in centre. Another arrangement provides a flush-latch in connection with the bolt, which fastens the casements in three points.

The bar may be applied to the bottom of the casement, which is a safeguard against weather. *See Advertisement Appendix, page* 104.

Hayward's Registered Secure Flush Bolt.

W. TONKS & SONS, *Birmingham.*

This bolt is fitted with a knob instead of the ordinary thumb plate. By means of a slotted plate the knob is turned when closed, so that by being in the way it is impossible to leave the doors unfastened, as the one door will not close until the bolt has been shot. *See Advertisement Appendix, page* 106.

Patent Window and Skylight Opener.

VERITY BROS., 12, *Call Lane, Leeds.*

This opener is adapted to open sashes as hoppers inwards or outwards, fanlights, lantern lights, and skylights; and also as a fastener. It is worked by hand, cord or rod, according to circumstances. *See Advertisement Appendix, page* 104.

Patent Sash Lever.

T. ELSLEY, 32, *Great Portland Street, W.*

This apparatus is to allow of the opening of fanlights or other vertical lights and skylights, and consists of a vertical rod, to which is attached a lever arm fixed to the light, so arranged that the weight of the sash is made to balance against the rod and handle. The rod is easily worked at the bottom by means of a cranked handle and plate. When desired to open several sashes at once, the same action can be applied.

Window Opener.—Beard's Patent Ventilating Apparatus.

C. BEARD, *Bury St. Edmunds.*

An apparatus to allow of the simultaneous opening of windows, out of reach in churches, schools, factories, etc., consisting of a galvanized iron tube running along the outside of the windows, upon which are affixed jointed arms worked longitudinally by an endless screw. It is specially applicable for opening clerestory windows.

Patent Triumph Fanlight Centre.

R. ADAMS, 7, *Great Dover Street, S.E.*

This centre allows of ease and quickness in fixing and the facility of the removal of the fanlight. The pivot or centre working in a true and complete bearing, the fanlight cannot be forced or jerked out of position. *See Advertisement on Back Cover.*

Patent Adjustable and Self-fastening Fanlight Opener.

R. ADAMS, 7, *Great Dover Street, S.E.*

This patent consists of a vertical iron or brass rod, united to a fulcrum lever stay fixed on to the fanlight, and, by means of a lever handle and rack within reach, regulates the extent to which the fanlight may be opened inwards or outwards. It also forms a secure fastening. A similar arrangement can be applied to open a number of sashes simultaneously for conservatories, lanterns, etc. *See Advertisement on Back Cover.*

Fanlight Openers and Fasteners.

W. & R. LEGGOTT, 27, *Charles Street, Bradford.*

This patent provides a means of opening and closing fanlights, skylights, ventilators, etc., at any height, by means of an iron arm fixed to the fanlight, serrated on the under side, and passing through a plate fixed to the frame, to which is attached a pulley with cog-wheel and an endless cord with balance-weight at bottom. In winding the cord, the cog-wheel working in the iron arm allows the fanlight to be easily opened to the required distance, and at the same time effectually locks it.

Mediæval Ironmongery.

HART, SON, PEARD & CO., *Wych Street, W.C.*

IRONFOUNDER AND SMITH.

Rolled Iron Girders.

HOMAN & RODGERS, 17, *Gracechurch Street, E.C.; and Manchester.*

The use of rolled iron to a great extent supersedes wrought-iron built girders for ordinary construction, on account of less cost and the numerous sections, which meet the requirements of length and load. A method of riveting one girder upon another was patented by Mr. Homan, whereby a great amount of additional strength is obtained, in the part of the girder usually the weakest. *See Advertisement Appendix, page* 107.

Homan's Patent Improved Flat Fireproof Floors.

HOMAN & ROGERS, 17, *Gracechurch Street, E.C.; and* 10, *Marsden Street, Manchester.*

This system consists of rolled iron joists, varying from 3-in. to 6-in. deep, and laid about 18-in. apart, from wall to wall, or on bottom flange of iron girders. A rough centering is placed under the joists, upon which cement concrete is filled, embedding the iron, and so rendering it indestructible. The tensional strains of the load are taken by the iron, and the compressive strains by the concrete, and not being arched there is no thrust on the walls. The ceiling is formed by plastering the underside, and the floor may be either of wood nailed to slips bedded in the concrete, or cement, asphalte, stone, etc. *See Advertisement Appendix, page* 107.

Fireproof Construction.

R. MORELAND & SON, 3, *Old Street, E.C.*

This method of construction consists in fixing sheets of curved corrugated iron from girder to girder, supported by light wrought-iron bowstring girders above which concrete is laid. Ordinary wood floors may be used above fixed to sleepers embedded in the concrete. The space between the curved corrugated iron and ceiling joists allows space for ventilation, and acts as a non-conductor to prevent sound between the lower and upper stories. Another system is by the use of bowstring girders, which, being embedded in concrete, the floor is a continuous slab, and no portion of the iron is exposed to fire.

Fireproof Construction.

DENNETT & INGLE, 5, *Whitehall, S.W.*

The concrete used for this construction is formed of broken stone or brick and plaster produced from gypsum. It is laid upon a rough centreing of boards, either as a slab or of an arched form; and recent fires have proved its fireproof character. The upper surface may be finished with a wood or tile floor, and the lower part plastered as a ceiling.

Fireproof Monolithic Stone Felt.

P. BRANNON, *Walton-on-the-Naze, Essex.*

A method of concrete construction having an iron skeleton trussing or webbing embedded therein gives great strength, and is especially adapted for floors, roofs, etc., of very large spans. It is fireproof, and many experiments have been tried with good results. It can be cast into any required form, and if desired, to imitate wood, stone, marble, or other materials, or it may be polished. Fireproof doors of this material are made as little as one and a half inches thick, and so light that they may be hung with ordinary butts.

The concrete is prepared with Portland cement mixed with Barrow clay, or burnt fire pipe or other clays, ground bricks, pottery, china and glass, etc.

Barffs' Process for Preserving Iron.

23, *Queen Victoria Street, E.C.*

The process consists in placing the articles to be coated in a specially constructed furnace, and subjecting them to the action of superheated air, or carbonic acid gas or steam, forming a protective coating of magnetic oxide, which is rustless.

Patent Iron Preserving Process.

DE LAVENANT & WILSON, 73, *Great Suffolk Street, S.E.*

This is a process for preserving and ornamenting iron by the application of a vitrious glaze on the surface of the metal whilst cold, which is then heated in an anealing furnace or oven. The metal being preserved from oxidation, the colour and glaze are fast, and renders pipes thus treated valuable for water, soil, and gas.

Artistic Wrought Ironwork.

HART, SON, PEARD & CO., *Wych Street, W.C.*
COALBROOKDALE COMPANY, LIMITED, *Holborn Viaduct, E.C.*
JONES & WILLIS, *Euston Road, N.W.; and Birmingham.*
H. MOBBS, *Northampton.*
ST. PANCRAS IRON WORKS, N.W.

Wrought-iron Doors and Frames.

ST. PANCRAS IRON WORKS, N.W.

General Castings.

HENRY MOBBS, *Lion Foundry, Northampton.*

This firm supplies light and heavy castings of all descriptions, including columns, sashes, fences, palisades, stoves, etc., the great aim being to produce work of good character and of the best description. A speciality is, that all moulds prepared from an architect's design are either destroyed or sent to him as soon as the casts are made, if desired, or a fee or royalty is paid to him, if the firm wish to use the moulds for other works, provided the architect's sanction is obtained. *See Advertisement Appendix, page* 111.

Gutters and Rainwater Goods.

H. MOBBS, *Northampton.*

HART, SON, PEARD & CO., *Wych Street, W.C.*

GENERAL IRON FOUNDRY COMPANY, 41, *Upper Thames Street, E.C.*

Strong Galvanized Wrought-Iron Sunk End Gutter.

GOSPEL OAK, IRON & WIRE COMPANY, 56, *Upper Thames Street, E.C.*

The advantages of this gutter are that it is straight and true, and well galvanized, and therefore more lasting than an ordinary cast-iron gutter, and requiring no painting is cheaper than that or zinc.

Galvanized Corrugated Iron Roofs and Buildings.

J. ARTHUR YOUNG & CO., 8, *Victoria Chambers, Westminster, S.W.*

Manufacturers of all kinds of iron roofing, especially for covering cattle, courts, sheds, fireproof hay or corn sheds. To facilitate their use at a distance from the works, the several portions are so arranged that they can be easily packed and put together by a local tradesman.

ST. PANCRAS IRON WORKS, N.W.

Verandahs and Ornamental Cast Work.

H. MOBBS, *Northampton.*

ST. PANCRAS IRON WORKS, N.W.

COALBROOKDALE COMPANY, LIMITED, *Holborn Viaduct, E.C.*

Roof Principals.—Howitt's Patent Tubular Rib or Girder.

13*a*, *Great George Street, Westminster, S.W.*

This rib is formed by iron tubes fitted together with unions to the required form for the roof (semi-circular or pointed), with base plates let into stone or brickwork, thus combining lightness with strength and obviating the necessity of a horizontal tie. The tubes are easily fitted together, and being light are inexpensive in carriage. They are adapted for conservatory and greenhouses, schools, farm buildings, rick covers, and other light roofs.

Staircases, Spiral and Straight, Balusters, etc.

H. MOBBS, *Northampton.*

ST. PANCRAS IRON WORKS, N.W.

GENERAL IRON FOUNDRY COMPANY, 41, *Upper Thames Street, E.C.*

COALBROOKDALE COMPANY, LIMITED, *Holborn Viaduct, E.C.*

Wrought-iron Fences, etc.

JOHNSON BROTHERS & CO., 6, *Waterloo Place, Pall Mall, S. W.*

This firm manufactures patent iron and wire rope fences for cattle and sheep, and, being galvanized, do not require painting. They are strained through wrought angle-iron uprights driven into the ground, and each wire strongly wedged in angle. Also wrought-iron continuous low fences for horses, cattle, and sheep, which consist of continuous iron bars passing through T iron uprights, and wedged at each side of upright, thus rendering the whole rigid.

Henson's Patent Wrought-iron Paling Fence.

ROBINSON & EYRE, 118, *Cannon Street, E.C.*

This fence is of wrought iron, with upright bars or pales, with three corrugations fastened to top and bottom rails of similar section, with bolts and nuts. These rails are fixed to rolled iron standards, nine feet apart. In addition to its strength and lasting qualities, it can be packed in a small compass for export, and easily put together.

Palisades, Fences, and Gates.

H. MOBBS, *Northampton.*

ST. PANCRAS IRON WORKS, N.W.

GENERAL IRON FOUNDRY COMPANY, 41, *Upper Thames Street.*

COALBROOKDALE COMPANY LIMITED, *Holborn Viaduct, E.C.*

Wrought-iron Water-tight Casements and Frames.

BURT & POTTS, 38 *and* 65, *York Street, Westminster, S.W.*

These casements are made to thoroughly exclude water and draughts; they are light in appearance but strong, and can be manufactured to any size, hung at side on brass hinges, to open outwards or inwards, and prepared to receive plate or sheet glass, lead lights, etc., and fitted with handles and stays of various qualities. They may be fixed to stone or wood frames. *See Advertisement Appendix, page* 109.

Wrought-iron Windows.

GENERAL IRON FOUNDRY COMPANY, LIMITED, 43, *Upper Thames Street, E.C.*

The leading feature in these windows (Moline's and Harris's patents) is a cast-iron ornamental boss at each intersection of bars. They are light in appearance and strong, and no patterns are required in their manufacture. *See Advertisement Appendix, page* 109.

Sashes, Wrought and Cast.

H. MOBBS, *Northampton.*

ST. PANCRAS IRON WORKS, N.W.

Patent Reflecting Pavement and Stallboard Lights.

W. BRASS, JUN., 47, *Old Street, St. Luke's, E.C.*

The speciality of this patent consists in reflectors of silvered glass, waved or fluted, fixed under an ordinary pavement grating, glazed with crystal plate. The reflectors being hung on centres, can be regulated to suit any angle, and adapted to reflect the light in any desired position, and may be fixed to old lights. *See Advertisement on Back Cover.*

Patent Pavement Lights.

HAYWARD BROTHERS & ECKSTEIN, 187 *to* 193, *Union Street, Borough, S.E.*

These lights consist of cast-iron frames into which are glazed semi-prism lenses, and so arranged that the light may be thrown forward in one direction —one side of the lens is upright or nearly so, and the other inclined to it at such an angle that the light passing through the upper surface may strike the inclined side, and be refluted completely within the lens, and issue from the nearly upright side in the required direction. *See Advertisement Appendix, page* 108.

Illuminating Gratings.—Hyatt's Patent Illuminating Gratings.

Farringdon Road, London, E.C.

This patent includes pavement, floor, and vertical lights, coal-hole plates, etc. The lens lights combined with silvered reflectors, by which means the greatest possible amount of light is obtained, which can be directed to any desired part of the basement.

Illuminating gratings are made with prismatic glasses, concrete or stone-facing, or with tile inlays; also in flaps with guttered or water-tight frames. *See Advertisement Appendix at Commencement of Book.*

Lodge & Payne's Self-locking Coal Plates.

J. PAYNE, 11 *and* 12, *Chapel Street, Edgware Road, N.W.*

In the centre of the coal plate is a wrought-iron stud-pin, which carries two loose arms, held in place by two split keys. If attempted to be removed from the outside, the arms grip more tightly, forming a good security against burglary, and preventing accidents through loose coal plates.

Stable Fittings and Appliances.

HART, SON, PEARD & CO., *Wych Street, W.C.*

ST. PANCRAS IRON WORKS, N.W.

GENERAL IRON FOUNDRY COMPANY, 41, *Upper Thames Street.*

Public Steam Laundries.

T. BRADFORD & CO., 140 *to* 143, *High Holborn, W.C.*

This firm fit up the necessary apparatus for washing and laundry works in Institutions, including washing machines, into which steam and water is admitted. The clothes when washed are rinsed and afterwards boiled in the same machine. They are then put into rinsing tanks and passed through wringing rollers into the centrifugal Hydro-extractor, from whence they are taken to the drying closets.

A somewhat similar arrangement in a smaller form, and worked wholly by hand power, is planned for gentlemen's houses, small schools, hotels, etc. *See Advertisement Appendix, page* 107.

Laundry Fittings, etc.

T. BRADFORD & CO., 140 *to* 143, *High Holborn, W.C.*

The Vowel Washing Machine, patented by this firm, is made in large or small sizes, for families or Institutions. The advantages claimed are that it is easy to work, a small expenditure for soap and soda, and the linen is not liable to tear, and may be used for washing material of the finest texture. The machine is adapted either to hand or steam power, and fitted with india-rubber wringing rollers.

The shuttle is another form of washing machine, and is adapted for special kinds of washing, requiring a concussive and dashing force. *See Advertisement Appendix, page* 107.

Improved "Draw-out" Drying Closet.

T. Bradford & Co., 140 *to* 143, *High Holborn, W.C.*

These drying closets consist of a number of horses to draw out on tram rails with iron rods for clothes drying. The inside of the closet is heated by steam and other methods, according to circumstances. *See Advertisement Appendix, page* 107.

Patent Radial Drying Closet.

T. Bradford & Co., 140 *to* 143, *High Holborn, W.C.*

These closets are made either single or double. The latter is built in brickwork, having two chambers with a heating stove between them. An iron radial horse, with 24 arms, is placed on each side of the stove. Means are used for ventilating the closets, by introducing fresh air and carrying off moisture, so that the drying process occupies from 10 to 20 minutes. *See Advertisement Appendix, page* 107.

Patent Portable Radial Combined Disinfecting and Drying Closet.

This consists of a portable closet made of iron double cased, with folding doors in front. An improved stove will heat the closet to 150° for ordinary drying, and up to 300° for disinfecting. A radial horse is fitted inside. *See Advertisement Appendix, page* 107.

Huthnance's Patent Drying Room Apparatus.

T. Elsley, 32, *Great Portland Street, W.*

In the centre of the wall dividing the drying closet from the laundry is placed a furnace capable of regulation and stoking from the laundry. On each side of this furnace is a door having the lower portion formed as a hit-and-miss grating, for admitting fresh air into the drying room. Sliding doors in the upper portion allow of some of the hot air passing into the laundry if desired.

Patent Self-Sustaining Single and Double Dinner Lifts.

Archibald Smith & Stevens, 48, *Leicester Square, W.C.*

The hand-rope of this lift is available on all floors; silent runners and india-rubber buffer stops are provided. If the hand-rope is released the load is automatically stopped; neither cage can run down or up unless the hand-rope is pulled, no further brake is required, and the gearing is silent. *See Advertisement Appendix, page* 125.

Patent Self-Sustaining Dinner and Warehouse Lifts.

Waygood & Co., *Falmouth Road, S.E.*

This lift is suitable for hotels and private houses, and consists of the ordinary lifting gear, with addition of Waygood's Patent Self-sustaining Brake by which the cage will not run down with a load in it, but remains stationary unless the hauling rope be pulled. It also makes a very handy book or dinner lift, worked with a handle from below, so arranged that the load will not run down; neither will the handle fly back. *See Advertisement Appendix, page* 122.

Patent Safety Water Balanced Lifts.

R. Waygood & Co., *Falmouth Road, S.E.*

This lift consists of ram cylinder, cage, and guides, and a separate balancing cylinder, by the use of which all chains and balance-weights are dispensed with, removing one great element of danger from passenger and other lifts. The speed of low-pressure lifts is considerably increased, the action smooth, and the size of ram reduced. The ram and cage are balanced, so that the water expended is only that required to raise the actual load. *See Advertisement Appendix, page* 122.

Monitor Patent Lift for Passengers or Goods.

T. B. Jordan, Son, & Meiké, 63, *Queen Victoria Street, E.C.*

This lift consists of two upright cylinders, one within the other, having pistons connected to a cross-head from which the power is transmitted over sheaves by wire ropes to the cage; the inner cylinder is used as a water balance, which in its return motion forces its contents of water into the upper tank, or back to the main. The arrangement of sheaves is such as that one foot of movement of the piston gives ten feet to the cage. It is safe in operation, being fitted with a special brake.

Ellington's Patent Hydraulic Balance Lifts.

The Hydraulic Engineering Company, *Palace Chambers, Bridge Street, Westminster; and Chester.*

This lift is so arranged that whatever the pressure of water available for working the lift may be, a sufficiently high pressure can be obtained in the lift itself to raise any required weight and to obviate the necessity for counterbalance chains and weights. The advantages claimed are safety, high speed of working, reduced consumption of water, diminished wear and tear, adaptability to various pressures of water, absence of mechanism above the cage. *See Advertisement Appendix page* 114.

Patent Wedge Safety Apparatus.

H. A. Davis, *Brindley Street, New Cross, S.E.*

A self-acting brake consisting of wedges with teeth, suspended independently of the lift-rope or cage by a cord affixed to the balance weights. The wedges travel upon the guides and in case of necessity they immediately receive the cage, and stop it instantly without jerking. The safety wedge can be applied to lifts already fixed.

Hot Air Pumping Engine.—Rider's Patent.

Hayward, Tyler & Co., 84, *Whitecross Street, E.C.*

A small caloric engine from one-fourth to one-horse power, specially adapted for pumping water to a considerable height and length. It can also be used for driving any light machines.

Annular Sail Wind Engine.

John Warner & Sons, 8, *Crescent, Cripplegate, E.C.*

This engine is self-regulating and specially adapted for raising water from wells and forcing it to any height by barrel pumps. It is also useful for general agricultural purposes.

Patent Hydraulic Organ Blower.

W. H. Bailey & Co., *Albion Works, Salford, Manchester.*

An automatic organ blower worked by Bailey's water motor, arranged for vertical or horizontal motion. It is easy to fix, noiseless, self-adjusting and regulating, and may be worked by water at a moderate pressure. These motors can also be adapted for working small machines.

Hydraulic Power.

General Hydraulic Power Company, Limited, *Falcon Wharf, Holland Street, Blackfriars, S.E.*

This company is established to supply hydraulic power for the purposes of working large and small lifts. Mains are laid in various parts of the Metropolis charged by powerful pumping engines, to which are attached pipes to the houses fitted with a meter, which registers the quantity consumed.

Bells and Fittings.

Hart, Son, Peard & Co., *Wych Street, W.C.*

Patent Pneumatic Bells.

G. Porter, 23, *Cullum Street, E.C.*

The system of these bells differs from the ordinary one by the use of a metal instead of an india-rubber transmitter or push. It is fitted with a piston and rod, and the indicator has also a cylinder and piston, so that when the piston of the transmitter is pushed the air is driven through the tube and raises the piston, which acts on the bell and signal. It is considered that great simplicity, durability, and power is obtained by this invention.

Cast Steel Bells.

Vickers, Sons & Co., Limited, *Sheffield.*

The advantages claimed for steel bells are a considerable reduction in the cost compared with bronze, a pure, clearly articulated and melodious sound, and being of a stronger material less liable to crack or suffer from the effects of severe frost. They vary from one foot to seven feet six inches in diameter.

Clock and Chiming Machine.

Gillett & Bland, *Whitehorse Road, Croydon.*

An automatic machine for chiming or ringing church or other bells, by means of which hand ringers are dispensed with. With the aid of clock work the machinery can be so arranged that the chimes may be set a week or any other time beforehand, and will play without manual attention.

STOVES AND WARMING APPARATUS.

Stoves of Ordinary Manufacture.

H. MOBBS, *Northampton.*
HART, SON, PEARD & CO., *Wych Street, W.C.*
GENERAL IRON FOUNDRY COMPANY, 41, *Upper Thames Street, E.C.*
STEVENS BROTHERS & CO., 35 *&* 36, *Upper Thames Street, E.C.*

Cast-iron Chimney-pieces and Over-Mantles.

COALBROOKDALE COMPANY, LIMITED, *Holborn Viaduct, E.C.*

Patent "Adaptor" Grate Splays.

THE COALBROOKDALE COMPANY, LIMITED, *Holborn Viaduct, E.C.*

These splays are made movable, and may be placed at any angle to suit the size of the stove and the opening. They are fitted with patent slips and frames, whereby tiles may be inserted from the front, and changed or removed without necessitating the removal of the stove. *See Advertisement Appendix, page* 110.

The Armstrong Abbotsford Stove.

ASHTON & GREEN, LIMITED, 14 *&* 15, *Bury Street, St. Mary Axe, E.C.*

The purpose of this stove is to admit air from the outside into a room properly warmed. This is accomplished by the use of the ordinary Abbotsford stove, but set in such a manner as to allow an air chamber at the back and sides of stoves. The cold air is admitted under the fire-basket, the bottom and sides of which are fire-brick; it passes behind the fire to a height of about 18 inches, and then into the chambers at each side of the stove, from whence it issues warmed into the room at the top of stove front.

Dr. Bartlet's Patent.

BARNARD, BISHOP & BARNARDS, *Norwich; and Queen Victoria Street, E.C.*

This stove has vertical front bars, which are so arranged (both between the bars themselves and also between the bars and the back and sides of fire basket), that as fuel descends it falls into freer space, which causes the fire to keep alive and burn a considerable time without attention. The fire basket being shallow all the living fuel presents its face to the bars of the grate, thus discharging the heat into the room instead of escaping up the chimney. *See Advertisement Appendix, page* 120.

The Ironbridge Controlled Combustion Grate.

THE COALBROOKDALE COMPANY, LIMITED, *Holborn Viaduct, E.C.*

The object of this grate is to introduce only as much air into the fire as necessary to produce perfect combustion, and so to avoid the sluggish fires and dirty-looking appearance of the slow combustion stoves. This is accomplished by forming tapering holes in the bottom of the fire basket, through which air passes into the fire, and a portion of the consumed ashes to fall into an ash pan underneath. *See Advertisement Appendix, page* 110.

Engert's Patent Coking Box, for Prevention of Smoke and Better Consumption of Fuel.

Three Mills Lane, Bromley-by-Bow, E.

The object of this patent is to consume the gases arising from the warmed coal before they can be condensed and converted into smoke by coming into contact with cold air. This is accomplished by means of a box behind the fire basket of an ordinary stove, which has a movable plate to push the coal into the fire worked by a screw. The coals are placed in this box and pressed forward from time to time.

This arrangement can be adapted to ordinary stoves by taking out the back. The open fire is retained and the cost of fuel reduced. A similar arrangement is adapted to kitcheners, stoves, and vertical boilers, and also for locomotives and furnaces.

Dr. Siemen's Gas and Coke Fire.

WADDELL & MAIN, 261, *Argyle Street, Glasgow.*

The invention consists of a copper plate introduced at the back of the grate, as being a good conductor of heat. This plate transfers the heat into a series of tubes through which the cold air passes into a chamber under the fuel and issuing at the bottom of the front bar impinges on a line of gas jets, which acts as a hot blast to the coke. When the coke is thoroughly ignited, the gas may be turned off at pleasure.

Kaio Kapnos Stove.

CLARK, BUNNETT & CO., LIMITED, 90, *Queen Street, E.C.; Rathbone Place, W.*

The advantages claimed for this stove are freedom from down draught, perfect combustion of fuel, an open fire, utilization of warm air round the stove, the means of heating hot water pipes from a back boiler, and good appearance.

The stove has a solid fire-brick bottom and sides. In lighting the smoke goes up the chimney in the ordinary manner, but when desired the register or valve is closed, and the smoke passes downwards into the heated chamber beneath the fire, and is consumed. It is so arranged that external air is drawn into the sides of the stove in which are placed a number of gills, and if desired a copper or wrought-iron boiler can be fixed at back for hot-water pipes or hot-water supply.

The stove will burn coke, anthracite, or common coal.

The "Kensington" Patent Smoke Consumer Stove.

BROWN & GREEN, *Finsbury Pavement, E.C.*

This stove is intended to burn ordinary coal, and consists of fire-brick, back and sides. The fire basket has a dish projecting in front, into which fresh coal is placed; when the fire requires replenishing it is pushed in at the bottom. By this means the red-hot coal is always at the top and fresh coal at the bottom, which causes the smoke to be consumed, and throws out a great heat with an economical use of fuel. *See Advertisement Appendix, page* 113.

"Imperial" Slow Combustion Grate.

TEUTEN & ROBOTTOM, 216, *Upper Thames Street, E.C.*

To overcome the objection often urged against a solid bottom, this stove is arranged with perforations to admit air under the fire, regulated either by a movable plate under the bottom, or by a perforated ash pan, with hit and miss slide in front. The back, sides, and bottom of the stove are formed of fire bricks. *See Advertisement Appendix, page* 113.

Improved Slow Combustion Interior Grate.

W. CORBITT & CO., LIMITED, *Rotherham.*

This grate is designed on the slow combustion principle, but with small openings in the bottom to allow just sufficient air to produce complete combustion and prevent a dead fire. The back is of solid fire-brick curved, so as to radiate the heat into the room. It is fitted with a sliding blower. The fire basket is broad and shallow to produce a good fire, and the bars are made to lift off for cleaning.

New Smoke Consuming Grate.

BENHAM & SONS, *Wigmore Street, W.*

This grate is arranged to have a store of coals for the day or night's consumption in the fire basket. The fire is lighted at the top and burns downwards, thereby consuming smoke and reducing the quantity of heat generally escaping up the chimney. The draught can be easily regulated by means of a register, and by a blind in front of the fire bars, worked by chains and weights.

Thompson's Patent Coal Economizer, Smoke Consumer, and Slow Combustion Stove.

H. THOMPSON, 60, *Essex Road, Islington.*

The ordinary register stove in appearance, but with a coal-box underneath the fire basket. The fire is lighted at the top and the fuel supplied from the coal-box by means of a plate attached to a lever. The advantages claimed are an open fire, perfect combustion, and consequent economy.

The Waverley Register Grate.

WELLS & CO., *Commercial Works, Shoreditch, and* 26, *Queen Victoria Street, E.C.*

This stove consists of a solid fire-brick bottom and sides, but the former is corrugated to allow of the entrance of the air, so that the difficulty usually experienced in obtaining a draught in kindling the fire is met without perforations.

The Wharncliffe Stoves.

STEEL & GARLAND, *Wharncliffe Works, Sheffield; and* 45, *Holborn Viaduct.*

These grates project forward into the room, and have an air-chamber behind. Fresh air being admitted through the outer wall (where practicable) becomes heated and passes through a perforated ventilator into the apartment, and also causes ventilation. These grates are made either with slow combustion or with the ordinary open bottom.

Wright's Patent Bivalve in Combination with the Siemens' Grate.

George Wright & Co., 155, *Queen Victoria Street*; *Works*, *Rotherham.*

The advantage of this stove is that gas and coke or anthracite is used in combination; the deleterious products of the former being consumed by the latter; the jets of gas are placed at the lowest level of the fire and pass upwards through a glowing mass of coke or anthracite. In consequence of the fire being supplied with a number of separated streams of heated air pouring a hot blast upon the jets of gas and incandescent coke, perfect combustion is ensured and smoke and smell are done away with

The "Comet" Automatic Ventilating Grate.

Morgan & Waide, *Bath Works*, *Rotherham*; *and* 61, *Queen Street*, *E.C.*

This stove is patented by Mr. Verrier; its advantages are claimed to be an open cheerful fire, slow and thorough combustion of fuel and smoke, and perfect ventilation. The grate is similar in appearance to an ordinary stove except that it projects farther into the room and is covered by a canopy or hood, into which the heat and smoke pass. The latter is taken into the ordinary flue, and the former allowed to escape into the room by an outlet at top of grate, or if desired, into an adjoining room.

At the back of the fire is an iron chamber fitted with enamelled gills; into this is admitted external air, which is warmed and passed into the room or other apartment.

Fire-Lump Ventilating Grate.

F. Edwards & Son, 54, *Great Marlborough Street*, *W.*

This grate is formed with fire lumps, and has a warm air chamber round the sides and back, into which external air is admitted, and being warmed passes into the apartment, or to a room above, if desired. This grate is specially adapted for schools, hospitals, barracks, etc.

Hospital Ward Ventilating Grate.

Adams & Sons, 57, *Haymarket*, *S.W.*

This stove is made with a solid iron bottom-plate, and fire-brick sides and back, on the slow combustion principle. The little smoke unconsumed passes up the chimney through an opening at the back of the fire-basket. Above the stove there is formed a hot-closet heated by the radiation from the fire below, and at each side are openings to allow warmed air to pass into the ward.

Hygiastic Ventilating Grate.

D. O. Boyd, 19 *and* 23, *Maddox Street*, *W.*

The principle of this stove is to give a large supply of fresh air to each room, cool in summer and warm in winter. This is obtained by means of flues, running from the basement to the top of the house. The air admitted into the basement passes up the flues, into a chamber under the fireplace, covered with an iron hearth, and from thence to the sides and back of stove, where, being well warmed, it is delivered into the room about one foot above the stove. The stove case is in terra-cotta, of ornamental design, requires no chimney-piece, and may stand against the wall without a chimney breast.

Hygiastic Ventilating School Grate.

D. O. Boyd, 23*a*, *Maddox Street, W.*

The purpose of this stove is to properly warm the air admitted from without, and allow of its escape into the room immediately over the stove front. This is done either by admitting the cold air through the external wall, or from a flue or trunk in the floor, and passing under a cast-iron plate or back-hearth and around the fire-brick sides and back of the stove, is delivered into the room in a warmed condition.

The Merivale Patent Grate.

Hardy and Podmore, *Ironfounders, Worcester.*

This stove is formed entirely of iron, and is placed in an ordinary chimney opening without the brick setting. Air is introduced from without, which, passing round the stove, is heated, and delivered into the room over the mantelpiece or other convenient place. A self-acting ventilation valve regulates the necessary quantity of fresh air required to keep the air in the room in constant circulation.

Pierce's Fire-Lump and Ventilating Grates.

T. Elsley, 32, *Great Portland Street, W.*

This grate consists of an ordinary iron front with fire-lump backs and sides, and projecting ribs or gills at the back. External air is admitted below the chimney opening which, passing round the ribs, is fully warmed, and may escape into the room either through the stove front or above the mantle, or if desired, into an upper or adjoining room.

The "Princess Louise" Grate, with Unbreakable Bars.

E. H. Shorland, *Erskine Street, Manchester.*

This stove is made with unbreakable bars to lift in and out, so that two, three, or five bars may be used at pleasure. It is adapted for ordinary and for slow combustion, and consists of an ornamental cast iron front, with fire-brick back and sides, and blower if required; and is stated to be a cure for smoky chimneys. The patent warm air generator or fuel economizer, can be adapted, which warms external air round the stove, delivered in a bedroom or other room contiguous.

Patent Projecting Fire Place and Patent Manchester Grate.

E. H. Shorland, *Erskine Street, Manchester.*

The object of this stove is to supply warm air either into a room in which the stove is fixed or in other rooms above. This is attained by air chambers at the back and side of the stove, and also under the back-hearth which is of iron. Cold air is admitted from without, and passing into these chambers is warmed and conducted by circular iron pipes placed in the smoke flue (which is enlarged for the purpose) to the outlets desired.

Whitwell's Patent "Save all Waste."

Coalbrook Dale Company, *Shropshire; and Holborn Viaduct, E.C.*

This stove preserves the usual open and cheerful appearance of a register-stove, at the same time giving a greater warming power with less consumption of fuel than is ordinarily used. This is done by means of an iron box fixed at the back of the stove, into which external air is admitted, and being warmed passes through vertical pipes into a chamber and is discharged into the room at the upper part of the stove, or, if desired, into another room. An air-course between the fire-brick back and the air chamber, prevents the air being burnt, assists the combustion, and reduces smoke. The arrangement of this stove promotes ventilation by drawing the vitiated air through the fire and up the chimney. *See Advertisement Appendix, page* 110.

Improved Kyrle Grate.

COLEBROOKDALE COMPANY, *Shropshire and Holborn Viaduct, E.C.*

A grate specially designed for the purpose of burning anthracite coal. It is lined with fire clay with solid bottom and a deflector brick fixed at an angle over the fire basket. The smoke passes between this and the back and is assisted by fresh air at back of fire. *See Advertisement Appendix, page* 110.

Independent Stoves.

AMERICAN STOVE STORES, W. POORE & CO., 155, *Cheapside, E.C.*

The stoves imported by this firm are of various sizes, and being independent of brick setting give out a great amount of heat. They are fitted with sliding doors, so that they may be used for slow combustion if desired. A movable blower allows a fire to be quickly kindled.

Syphon-Action Ventilating Tile Grate.

DOULTON & CO., *High Street, Lambeth, S.E.*

This stove is fitted with an open fire but of slow combustion, and specially designed for anthracite and smokeless coal. It consists of an ordinary stove with fire-brick back, sides and bottom. Whilst the fire is being kindled a pair of shutters are drawn together in the front, causing a strong draught through the fire and up the ordinary smoke flue. When well alight the shutters are opened and the smoke valve or register closed. The surplus heat and unconsumed smoke is then received into a horizontal flue immediately above the fire basket. The vacuum caused in the chimney draws the smoke down a vertical flue at the side of the fireplace, which communicates by a diaphragm at the bottom with another vertical flue, opening into the smoke flue. The external air is admitted below, and being heated by contact with the stove and flue escapes into the room in the upper part of the stove, and is regulated at pleasure.

George's Patent Calorigen for Coal or other Fuel.

J. F. FARWIG & CO., 36, *Queen Street, Cheapside, E.C.*

The object of this stove is to warm fresh air, for which purpose a pipe from the exterior of a building communicates with a coil in the stove, the air being heated, enters the room at the top of the stove. The vitiated air is drawn through the fire box and up the flue, thus affording ventilation. The stove is especially adapted for the warming of halls, passages, stair-cases, etc., and advantageous for drying and airing buildings or apartments. The consumption of fuel is small. *See Advertisement Appendix, page* 114.

Improved Patent Slow Combustion Calorigen.

J. F. Farwig & Co., 36, *Queen Street, Cheapside.*

This stove is somewhat similar in character to George's Patent Coal Calorigen, except that instead of coils of pipe there is a fresh air chamber at the back of the furnace, into which air is admitted, and passes out properly warmed at the top of the stove. An air space round the furnace prevents the air from being burned. The interior is formed of fire-clay, and the fuel hole is so arranged that no fumes escape when fuel has to be renewed. It will continue alight for twelve hours without attention at a nominal cost for fuel, which may be coke or anthracite coal. *See Advertisement Appendix, page* 114.

Lambeth Radiating Tile Stoves.

Doulton & Co., *High Street, Lambeth, S.E.*

These pedestal stoves are on the slow combustion principle, burn coal or coke, and are stoked either from the bottom or top. They are constructed of fireclay, with glazed tiles on the outside, and possess the advantage over iron stoves of being free from smoke and smell, and capable of burning for periods of twelve to thirty-six hours without feeding, varying according to the size, and suited for halls, shops, public buildings, conservatories, etc.

Nautilus Grate.

James P. Petter, *Yeovil, Somerset.*

This grate is in the form of a nautilus shell, and made of iron with fire-brick linings. The smoke instead of escaping up the chimney passes through the fire and is so consumed, the products being carried up a small flue on each side into the chimney. It has an open fire, and is cheerful in appearance, and not being fixed presents a large quantity of heating surface, thus giving the greatest warming power with the least consumption of fuel.

Pedestal Stoves.—Pyro-Pneumatic Warming and Ventilating Stove Plates.

T. Elsley, 32, *Great Portland Street, W.*

This stove consists of an iron ornamental case, perforated at the top. The fire place, which is open, is surrounded by fire clay lumps, perforated or hollowed out by vertical air passages. External air is admitted at the bottom, which, passing round the backs and sides of the fire lumps, is properly warmed and discharged at the top of the stove.

The Tortoise (Portway's Patent) Slow Combustion Stoves.

Brangwin & Co., *Hackney, E.*

An independent close stove, varying in size from nine inches in diameter upwards, suitable for warming rooms, halls, green-houses, etc., and with boiler for hot-water pipes, if needful. The stoves are lined inside with fire-brick, the outsides being either plain iron or ornamental tiles. The advantages claimed are a great amount of heating power at a very small cost, cleanly, and free from smell, and requiring little attention,

Ranges and Cooking Apparatus.

H. Mobbs, *Northampton.*

General Iron Foundry Company, 41, *Upper Thames Street, E.C.*

Coalbrookdale Company, Limited, *Holborn Viaduct, E.C.*

Cooking Ranges.—Combined Open and Close Range.

American Stove Stores, W. Poore & Co., 155, *Cheapside, E.C.*

This firm imports several varieties of pedestal cooking stoves. They contain a furnace with an open or closed fire, a large oven, a detached boiler and hot plate at top for four or more boilers or kettles, and provision for heating irons.

Cooking Apparatus.

F. Edwards & Son, 54, *Great Marlborough Street, W.*

The advantages of the Economic Tile Kitcheners are the use of tiles to the greatest extent, both to doors and covings, keeping the ovens warm and giving a clean and light appearance. Special ventilation is provided for the roasting oven. A movable bottom enables the fire to be increased or decreased, according to the cooking required. A ventilating flue is always in operation and prevents soot falling on to the hot plate.

The "Falkirk" Smokeless Close Fire Kitchener.

R. W. Kennard & Co., 67, *Upper Thames Street, E.C.*

The furnace of this kitchener is arranged on Dr. Siemens' plan of using gas in connection with coke. A gas tube with burners is fixed in front of the furnace under a bottom plate fitted with gills. In lighting, paper and wood are dispensed with; the gas being lighted permeates the coke until well alight, when it may be turned out. The air passing into the fire is warmed by the gills, and tends to promote perfect combustion, and prevents the sulphurous smell usually produced by burning coke. It may readily be applied to any range.

Smoke Consuming Kitcheners.

Brown & Green, Limited, 72, *Finsbury Pavement, E.C.;*
and Luton, Bedfordshire.

This range is constructed specially for burning ordinary coal, but is also adapted for anthracite or coke. The fuel is put into a front box and pushed in at the bottom of the fire, causing the smoke from the fresh coal to be consumed by the live coal. Cold air is admitted at the bottom of the plate. The advantages claimed are more perfect combustion, greater heating power to the hot plate, oven, etc., and a less consumption of fuel than in ordinary fires. *See Advertisement Appendix, page* 113.

Stevens' Prize Kitchener.

Stevens Brothers & Co., 35 *and* 36, *Upper Thames Street, E.C.*

This kitchener is fitted with the modern improvements for good cooking, and can be so regulated that the whole of the heat may be directed to one oven or divided at pleasure. A special feature is the patent self-acting cone ventilator, which carries the smells of cooking up the chimney.

The Patent "Treasure" Range.

T. J. CONSTANTINE, 61, *Fleet Street, E.C.*

These independent cooking ranges are made in several sizes, ranging from 18-in. to 60-in. wide, and comprise either one oven, or oven and boiler, or two ovens and hot plates above. The advantages claimed are that they will burn anthracite coal, or any kind of coal and fuel, and that they consume their own smoke, and by economizing the heat, a saving of fuel is effected. Greater heat than ordinary is obtained for the ovens, and they and the boilers are larger in proportion to other ranges. That being self-contained, they are easily removed, and require no brick, setting, or fixing.

The "Wilson" Portable Cooking Range.

THE WILSON ENGINEERING COMPANY, LIMITED, 247, *High Holborn, W.C.*

An air valve regulates the fire, so that almost all the heat engendered is employed in the range, and but little passes up the chimney. The cold air is made to travel through flanged chambers heated by the fire box. The combustion of the smoke and noxious gases is effected by means of intensely superheated air. The ranges are portable, and made from 18-in. to 5-ft. 6-in. in width, and require no brick setting, the smoke-pipe being carried into any chimney. The top of the range is provided with hot plates for stewing, etc.

"Princess Louise" Open Fire Coil Grate.

W. & S. DEARDS, *Harlow, Essex.*

The feature of this stove is that strong hollow tubes are substituted for ordinary fire bars, encircling the fire in front, on both sides, and back, so that it is specially adapted for heating water for baths, rooms, or conservatories. It will burn a considerable time without attention. Smokeless coal, as being most economical, may be used.

The Thermhydric Ventilating Hot-Water Open Fire Grate.

POTTER & SONS, 361, *Oxford Street, W.*

This invention, patented by Mr. Saxon Snell, consists of an open fire grate, surrounded on three sides and top by a wrought-iron chamber, containing water, which being warmed, circulates through upright coils of pipes. The hearth is of iron and the space below the grate forms a chamber for the admission of air from the outside, which passing upwards is warmed by the hot water without being burnt.

New Patent Hot Water Boilers.

T. H. P. DENNIS & Co., *Chelmsford, Essex.*

An independent boiler having a hot air casing outside, whereby fuel is economized, radiation prevented, heat utilized, perfect combustion ensured, and no danger from fire. The casing consists of an arrangement of chambers, so that a continuous current of heated atmospheric air is introduced both under and above the burning fuel, causing perfect combustion and but little smoke.

Green's Patent Improved Tubular Hot Water Boiler.

Surrey Works, Blackfriars Road, S.E.

An independent boiler having a series of horizontal tubes above the furnace, around which the flame and heated air pass before escaping up the chimney The fire can be made to last from twelve to twenty-four hours without attention. Any number of flows and returns can be annexed to the boilers.

Hot Water Heating Apparatus.—Marriott's Patent.

Higham Ferrars, Northamptonshire.

This apparatus consists of a row of wrought-iron tubes below the furnace, which serve as fire bars; and a wrought welded iron vertical boiler, circular or plain, surrounding the furnace, whereby the greatest amount of heating surface is exposed to the fire. It is useful for heating large or small buildings, greenhouses, etc.

Hot Water Heating.

J. L. Bacon & Co., 476, *Oxford Street, S.W.*

The method adopted for heating by hot water is by continuous lengths of wrought-iron tubes one and a half inches diameter, a portion being formed into a coil and placed in furnace. The advantages claimed for small pipes over ordinary low pressure ones are that they contain less water and are quicker heated, causing much greater rapidity of circulation, and are capable of being easily regulated; also that they are more readily fixed, and can be placed in positions where larger ones could not be used, and they take less room. They may be fixed in coil cases, along the walls, or above or below floors, or in other positions most convenient.

Pritchett's Patent Hot Water System, for Economizing Heat and Fuel without Smoke.

W. & S. Deards, *Harlow, Essex.*

Corrugated double metal plates, either wrought or cast, are placed vertically for the circulation of water or steam, thus affording a large heating surface. They take up less room than coils, and can be decorated or enamelled as required, so as to form a portion of the fitting up of a room or conservatory or other place to be warmed.

Ben's Boiler.

B. W. Warhurst, *Highgate Road, London, N.W.*

This is a wrought-iron welded boiler, of saddle shape, with side and top flues formed in the boiler, and a special ⊥-shaped cross bridge and end tubes, giving large heating surfaces, and ensuring a rapid circulation of hot water for heating public buildings, ranges of glass-houses, etc., with a small consumption of fuel. *See Advertisement Appendix, page* 114.

The Monarch Boiler.

B. W. Warhurst, *Highgate Road, N. W.*

This is a boiler for the same purpose as the last named, with wrought-iron elbow tubes welded into an outer boiler, of either conical or saddle form, avoiding the risks attendant on cast iron, and ensuring quick heating, and economy of fuel. *See Advertisement Appendix, page* 114.

Hot Water Warming.—Ornamental Panelled Coil.

The Meadow Foundry Company, Limited, *Mansfield.*

By the use of this coil the ordinary coil case is dispensed with. The pipes have ornaments at the ends and centre, bold relief, and are fitted into blocks at ends, also ornamented.

The Economic Patent Slow Burning Smokeless Warming Apparatus.

Derwent Foundry Company, Limited.

A slow combustion apparatus suitable for churches, halls, schools, etc., on the principle of a gill stove. It is placed in a pit into which fresh air is admitted, which passing over the furnace is warmed, and escapes into the apartment through an open grating. It is stated that almost the whole of the heat is retained, and the circulation of air is so arranged that equal warmth is obtained without the expense of warm air flues.

Moule's Patent Warming System.

H. J. & J. W. Girdlestone, 5a, *Garrick Street, Covent Garden, W.C.*

The chief feature of this invention is that under the bars of the furnace is placed a movable tank filled with water. By the heat of the fire the water is converted into steam, which passing upwards into the fire is to some extent decomposed, whereupon the hydrogen unites with the air, and on combustion generates heat. The water tank prevents the loss of heat by downward radiation. The heated air passes through flues under the floor of the building, which becomes gradually and gently heated.

Gurney Stoves.

London Warming & Ventilating Company, 23, *Abingdon Street, Westminster, S. W.*

These stoves by having the enclosure formed with a number of gills, present a large heating surface. They may be placed in a pit in which the fresh air is admitted from without, and warmed by contact with the outer surface and delivered into the building. They are specially adapted for use in warming large buildings, but stoves are made on a smaller scale and in a somewhat different manner for heating halls, greenhouses, etc., in connection with ordinary hot-water pipes.

The Whiting Stove.

T. H. P. Dennis, *Chelmsford, Essex.*

A pedestal stove for warming schools, churches, halls, and large buildings. It consists of an ordinary furnace lined with firebricks, with open fireplace, but fed from the top. At the back of the fire is a compartment divided by horizontal plates, into which the smoke and hot gases pass three times round vertical air tubes, causing a strong upward current of the air which is brought in from under the floor, passed into a hot-air receptacle, and thence into the apartment. By this arrangement but little of the heat produced by the furnace is allowed to escape up the chimney, and a saving is caused in the cost of the fuel.

Grundy's Patent Heating Apparatus.

30, *Duncan Terrace, City Road, N.; and Tyldesley, near Manchester.*

The air is heated in a sunken chamber, and conducted by a flue, enters the building to be warmed through an open iron grating in the floor. Means are provided to draw out the cold air in the building so as to produce an even temperature. It is specially adapted for churches, schools, and other large buildings.

Patent Warming and Ventilating Apparatus.

LEWIS & ADAMS, *Royal Exchange, Middlesbrough-on-Tees.*

A method of heating buildings, conservatories, or green-houses, by means of air brought from the outside of the building and warmed over a furnace, and conducted by flues to various parts of the building, previous to which it is tempered or moistened by contact with a vapourizer supplied by water. The furnace also acts as a ventilator, drawing the vitiated air from the building, and when not required for warming, may be used as an artificial ventilator.

Hot Air Warming.—Constantine's Patent Convoluted Stove.

Chorlton Mills, Hulme Street, Manchester.

An independent stove or furnace which may be placed in a chamber or pit, for the purpose of heating large or small buildings, Turkish baths, halls of houses, etc. The stove consists of a number of wedge-shaped iron plates, surrounding or forming the sides of the stove, and presents a considerable surface for heating the air, which is admitted from the outside. The back and sides of the stove are partly lined with firebrick, to protect the metal from immediate contact with the fire. The combustion is slow, and the air is not over dried or vitiated.

The Shrewsbury Warming Apparatus.

T. GREGORY, *Clapham Junction Works, S.W.*

This apparatus consists of a radiating furnace placed in a chamber into which external air is admitted in such a position that it will mingle with the air heated by the furnace, but not in contact with it. The furnace is constructed on the slow combustion principle, and will burn from fifteen to twenty-four hours without attendance.

Patent Fire Door.

HOWATSON PATENT FURNACE COMPANY, LIMITED, 85, *Gracechurch Street, E.C.*

The object of this patent is to regulate the admission of air to the furnace by closing the air passage gradually after stoking, which is done by means of a flap door working on a horizontal axis. To the lower side of this is connected a rod attached to a piston working in a cylinder containing mercury. In the bottom of the piston is a small hole through which the mercury is forced up, and gradually closes the door. By this means a saving in fuel is effected.

The Fossil Meal Composition.

A. Haacke & Co., 21, *Lime Street, E.C.*

The material is composed of small shells, consisting of pure silica, and is able to absorb water to the amount of two or three times its own weight, thus producing a good non-conductor and a fire-resisting substance. It is applied in the nature of mortar, and forms a non-conducting material for covering steam boilers, pipes, and cylinders, cisterns and tanks, hot-air and water-pipes, and for protecting cold water pipes from frost.

GAS LIGHTING AND WARMING.

Air Gas.—Improved Air Gas Company's Patent Apparatus.

W. Parham, *Northgate Works, Bath; and Oxford Street, W.*

This apparatus produces gas by forcing a continuous current of air over mineral oil, by means of a self-acting blower, the air absorbing and retaining in solution the illuminating vapours given off by the oil and transformed into gas. It is purer and of greater illuminating power than coal-gas, and will not explode. The apparatus consists of a blower and generator. The former is driven by a weight acting only when a burner is turned on, and requires winding once a day. The generator contains the gaseoline, from which the gas is manufactured.

Gas Regulators.

Carnaby's Patent Safety Gas Apparatus, 13, *Broad Street, Bloomsbury, W.C.*

This apparatus consists of a clock-like machine, with wires attached to the main gas tap, worked by a key at any convenient part of the premises, having a graduated dial showing how far the main tap is opened. By this means the supply of gas is regulated before it passes through the meter, and the pressure proportionately reduced. By its use the gas may be wholly turned off where most convenient.

D. Hulett & Co., 55 *and* 56, *High Holborn, W.C.*

To prevent pressure on gas-pipes, and to promote evenness of flame, consumption of smoke, and consequent economy in gas burning; this regulator is fixed to the gas-main. It consists of a valve attached to a spindle heavily weighted. The joints being immersed in mercury there is not the fear of evaporation which might arise from the use of water as a seal.

Patent Metallic Diaphragm Gas Governor.

J. PORTER, 23, *Cullum Street, E.C.*

The advantage claimed for this governor is a great saving in the cost of gas with perfect combustion and greater illuminating power. It is automatic in its action, and can be applied to existing meters. The gas passing into a cylinder raises a diaphragm and closes the valve. When the burners are turned on, the pressure upon the diaphragm is proportionately reduced, and sufficient gas is then allowed for the number of burners lighted.

Gas Fitters.

JONES & WILLIS, *Euston Road, N.W.; and Birmingham.*

Phos. Kallestalta; or Perfect Gas Burner.

COMYN, CHING & CO., 22 & 23, *Little St. Andrew Street, Upper St. Martin's Lane, W.C.*

These burners can be readily fixed to old fittings, and ensure a rich light with a small consumption of gas, free from hissing, and so arranged as to give all the advantages of a gas regulator.

SIEMENS' PATENT GASLIGHT COMPANY, 40, *Queen Victoria Street, E.C.*

The new light made by this company is specially adapted for street and outdoor purposes, and for factories, workshops, and other places requiring a large and brilliant light. The lights are so constructed that the gas is fully consumed, thereby causing increased illumination, great economy, steadiness, and perfect ventilation, and so designed that no shadow is cast.

Gas Lighting.

THE SILBER LIGHT COMPANY, 49, *Whitecross Street, E.C.*

This burner is of circular form, and so constructed that four concentric supplies of atmospheric oxygen have access to the flame, arranged to consume the particles of carbon usually passing off unconsumed, thus giving a larger light for the same consumption of gas. A saving of twenty-five per cent. is claimed by the use of this burner, as well as a purer atmosphere.

Sunlights.

HODGE AND COMPANY, *Hatton Garden, E.C.*

These lights differ from the ordinary sun burners in having an inlet for the vitiated air immediately below the ceiling instead of at the level of the sun burner, as is usually the case. The chimney from the gas burners passing through the ventilating shaft causes a powerful up-draught. Some small lights on the outside ring of the sunlight prevent the dark shadow cast on the ceiling and upper part of the walls, and assist the ventilation.

Patent Ventilating Sun Burners.

STRODE AND COMPANY, 19, *Osnaburgh Street, Regent's Park, N.W.*

One of the specialities of this patent consists in a valve to prevent down-draught, which is operated by the pressure of gas in the supply-pipe acting on an inverted vessel floating in mercury in such a manner that it opens instantaneously on turning the gas on for lighting, and closes directly it is turned off, and preventing cold air from passing down the ventilating pipe when the sun burner is not in operation.

Ricket's Ventilating Globe Lights.

RICHARDSON, SLADE, AND COMPANY, 18, *Brownlow Street, Holborn, W.C.*

This light consists of an Argand burner in an ornamental glass globe over which is a pipe to carry off the vitiated air into a chimney or outside the building. This passes through a trunk, which prevents the heated pipe from contact with woodwork, and having an opening from the ceiling of the room forms a powerful extraction shaft, considerably aided by the heated gas escape pipe. The trunk is also arranged to admit fresh air.

Gas Bath Boilers.—Patent Bath Boiler.

VERITY BROTHERS, *Regent Street, W.*

This is a pedestal boiler to stand at the head or foot of the bath. The cold water is admitted at the bottom, and being warmed by an arrangement of gas burners in a cylinder inside the boiler, is discharged from the top into the bath. No flue is required, and it may be easily fitted. It is stated a bath heated to ninety-five degrees can be obtained in twenty minutes.

Boilers on the same principle may be fitted to supply lavatories, stables, etc.

Gas Baths.—The "Calda" Instantaneous Water Heater.

J. SHREWSBURY, 59, *Old Bailey, E.C.*

Cold water passing through "Calda" in a cylinder heated by gas, raises the temperature of water from 50° to 115° one gallon per minute, according to the size. The cylinders may stand at the side of bath and only require attaching to cold water and gas pipes.

The same maker raises the temperature of water in baths by means of his patent gas burner under the bottom of the bath.

Æolus Patent Multitubular Ventilating Stove.

GENERAL VENTILATING COMPANY, LIMITED, 235, *High Holborn, W.C.*

This stove consists of a series of metal tubes open at both ends enclosed in a metal case. An atmospheric burner heats the tubes, and the fumes of the gas are carried off through a pipe at back. A communication is made with the outer air which, passing through the pipes, becomes heated and enters the room from the top of the case. *See Advertisement, Appendix, page* 117.

Patent Pure Air Ventilating Stoves.

BENYON & COX, *Torbay Iron Works, Torquay.*

This stove is constructed to both warm and ventilate the apartment in which it is used by passing into and through it, a constant stream of warmed fresh air. For this purpose the heated products are confined and kept quite distinct in the body of the stove; through these run tubes, conveying fresh air from outdoors; this in its passage (which is instantaneous) is heated to any desired temperature up to 300° Fahrenheit.

George's Patent Gas Calorigen for Warming and Ventilating Apartments.

J. F. FARWIG & Co., 36, *Queen Street, Cheapside, E.C.*

The peculiarity of construction in this gas stove, which diffuses heat principally by convection, consists of an outlet so arranged with regard to the inlet (both being external to the apartment), that only so much air passes either way as is required to support and carry off the products of combustion.

The heat generated by combustion warms a thin coil of sheet iron in the interior of the stove, the coil being in communication at one end with the external atmosphere, and at the other with the apartment, thus a stream of fresh air, which is warmed in its passage, is drawn into, and equally diffused throughout the apartment. *See Advertisement Appendix, page* 114.

Leoni's Patent Incandescent Perfect Radiant Gas Fire.

St. Paul's Street, New North Road, N.

The apparatus is portable, and consists of an iron frame hooked on to the bars of an ordinary grate, and supplied with gas by means of a flexible tube from the nearest gas burner. The unwholesome effect usually attendant on gas stoves is prevented by the unconsumed gas passing up the chimney. The amount of gas burnt is very small, and a great heat can be obtained at a trifling cost. To prevent down-draught a special arrangement has been patented.

Strode Gas Fire.

STRODE AND COMPANY, 48, *Osnaburgh Street, N.W.*

An arrangement whereby gas can be laid on to any fireplace for the purpose of igniting anthracite coal or gas coke. When the fuel is well alight the gas may be turned off wholly or in part, and turned up again at pleasure. By the combined arrangement of gas and fuel a great saving over ordinary gas stoves is gained.

Gas Stoves.—The "Syphon."—Clark's Hygienic and Economic Stove.

HYGIENIC HEATING AND LIGHTING CO., 16, *North Buildings, Finsbury, E.C.*

These stoves are made to burn either gas or oil, and consist of three tubes or cylinders, in the centre one is placed the light into which air is drawn from the outside of the building if desired. The heated air passing to the top of this cylinder is condensed and relieved of the noxious vapours before it passes into the room, and thereby doing away with the necessity of a chimney. An arrangement of copper tubes and boiler is provided for heating greenhouses. Cooking stoves are also made with the same title.

Portable Gas Heating Water Coils.

Dr. W. H. STEPHENSON, *Ainsworth Street, Blackburn.*

This system consists of an arrangement of tubes placed over one another and connected at the ends by smaller tubes, through which water circulates. A pipe of somewhat smaller diameter is placed in the outer pipe, containing water all round, allowing a radiating surface on the inside as well as the outside. The gas flame acts directly on the lower tube, and the fumes are carried off by a flue. The tubes are made of sheet copper. If desired for a sick room, vapours of water or medicated substances may be placed in the inner tube, and diffused into the room.

"Save all" Gas Stoves.

Benyon & Cox, *Torbay Iron Works, Torquay.*

One of the principal features in this gas cooking stove is that the food cooked therein is carefully protected from contact with gas fumes, which the makers assert has been proved to be highly prejudicial. Any temperature desired can be produced in the roasting chamber or oven, which is freely supplied with fresh air. The top of the stove is fitted for boiling and frying, and there is a grilling and toasting arrangement attached.

Gas Stoves and Kitcheners.

H. & C. Davis & Co., 200, *Camberwell Road, S.E.*

The advantages claimed for the use of gas in cooking are that in addition to their cleanliness, the heat being uniform and nicely regulated, the juices are retained, and the meat is finer in flavour and more tender and juicy than is the case by the use of coal ranges, as well as being more nutritious, and a very considerable reduction in the waste.

Petroleum Stoves.

The Silber Light Company, 49, *Whitecross Street, E.C.*

A small portable cooking stove, made of cast iron, fitted with oven and hot plates, heated by oil. The burners are placed at both ends of the stove, and the heat from them rises through tubes or chimneys, carrying it around and over the oven. The stove may be used for heating purposes only, by unhooking the oven door and placing a copper reflector on the inside. A small ornamental stoneware stove is made for heating, mounted on a stand with castor legs, so that it may be easily removed from room to room.

Fittings for Oil and Candles.

Hart, Son, Peard & Co., *Wych Street, W.C.*
Jones & Willis, *Euston Road, N. W.; and Birmingham.*

ELECTRIC LIGHTNING CONDUCTORS, ETC.

Lightning Conductors.

Hart, Son, Peard & Co., *Wych Street, W.C.*

Solid Copper Tape Lightning Conductors.

R. C. Cutting & Co.

Copper bands, varying from 5/8-in. to 2-in. wide, are fixed against buildings 3 feet above the highest point of the structure, and carried into the earth from 6 feet to 10 feet from the building into a pit filled with powdered coke, in which is embedded a copper plate. Where the tape is required to be joined a special coupling is used, which allows the tape to pass through it without soldering or riveting, so that a metallic continuity is secured throughout the entire length.

Patent Continuous Copper Band Lightning Conductors.

J. W. GRAY & SONS, 115, *Leadenhall Street*, *E.C.*

The conductors used by this firm are continuous copper bands not less than 1¼-in. wide, for main conductors, and 1-in. for branches, as being safer and more lasting than the ordinary copper wire rope. Their patent system brings all the salient points of the structure into connection with the main conductor, and by this means no matter on what portion a stroke of lightning may descend, the conductor being incorporated with one continuous service will carry off the discharge.

Electric Lighting.

SWAN'S ELECTRIC LIGHT COMPANY, 15, *Mosley Street*, *Newcastle-on-Tyne.*

The Swan lamp consists of a small glass globe from which the air has been exhausted, and in which is fixed a thin filament of carbon connected with two platinum conducting wires, which pass through and are fused into the glass. The carbon not being in contact with the air there is no combustion. The electric current for working is produced by a dynamo-electric generator, driven by steam or gas engine, or water power. These lamps are specially adapted for internal lighting.

THE PILSEN, JOEL, AND GENERAL ELECTRIC LIGHT CO., LIMITED,
St. Stephen's Chambers, *Telegraph Street*, *E.C.*

This company possesses three systems of electric lighting, viz.: (1) The Pilsen Arc Light; (2) The Joel Semi-Incandescent Light; (3) The Gatehouse Incandescent Lamp. The first is specially adapted for large spaces, streets, or large buildings, being usually of 2,000-candle power. The second is about 200-candle power, warmer in colour, and adapted for lighting picture galleries, shops, factories, etc. The third is from 5 to 50-candle power, steady, and of warm colour, and specially adapted for domestic lighting, either in standards or electroliers.

Lane-Fox System of Electric Distribution.

ST. GEORGE LANE-FOX, 39A, *Threadneedle Street*, *E.C.*

This system consists in the construction of secondary batteries, with a system of parallel arc distributors. From the generator mains lead to accumulators or secondary batteries, with branches to the lights. The advantages are, that instead of having a very powerful engine to supply the lights, when needful, a smaller engine may be working almost continuously, and even if it were to stop for a short time, the lights would be unaffected.

PLUMBER.

Zinc Roofing.

F. BRABY & CO., *Fitzroy Works*, *Euston Road*, *N.W.*

The use of solder in laying zinc is avoided. The patent sliding stud allows of expansion and contraction, and at the same time keeps the roof water-tight. The patent solid ridge plate avoids the usual soldering of roll caps with ridge, and the patent solid stopped end forms a good finish. The roll cap allows the sheets to be perfectly free, as it is secured by a special clip.

Patent Roof-Light Ventilator.

F. BRABY & CO., *Euston Road, N. W.*

This Ventilator is made of strong zinc, and serves also as a skylight. It consists of a square plate easily fixed to the roof, the centre being open and turned up as a flange. The Ventilator is hinged with a frame of ⅂ form, which closes over the flange and renders it weather-tight.

Pumps—Lift, Standard, Iron Frame, etc.

J. TYLOR & SONS, *Newgate Street.*

Water Pipes.

PATENT LEAD ENCASED BLOCK-TIN PIPE COMPANY, 15, *Finsbury Place, South, E.C.*

The danger to health produced by drinking water circulating through lead pipes, has been the cause of the manufacture of lead pipes encasing a pipe of block-tin, the two pipes being united are pliable and have all the advantages possessed by the lead pipe. The water passing through the tin is not contaminated. Joints may be made in the usual way, but special couplings are provided which are better, and in some cases cheaper.

PATENT JOINING LEAD PIPE COMPANY, *South Parade, Manchester.*

This method of joining lead pipes consists of a lining-pipe, with a bore equal to the bore of the pipes, which is inserted in the two pipes to be joined. A purpose-made mould is temporarily fixed round the pipe and solder poured in. By this means the solder cannot get into the pipes to stop them, and no external joint is visible. A saving is claimed in cost of solder and labour.

Lead Soil Pipe Traps.

DENT & HELLYER, *Newcastle Street, Strand, W. C.*

This trap is for fixing outside a house, and consists of a V-shaped trap, with which the soil pipe and drain are connected. A screw-cap is fitted on the top of the cap for inspection and clearing out. An air pipe is provided for ventilation to soil pipe, and also a provision for a ventilating pipe to drain and trap.

Patent Cast-Lead Traps.

DENT & HELLYER, 21, *Newcastle Street, Strand, W.C.*

These traps are made from pure pig lead without solder or seam, and are smooth inside and out. They are made of several sizes from one and a half inches to four inches diameter and fitted with brass screw caps for cleaning.

Patent "Paragon" Cast-lead Traps.

PARKER, *Amberley Mews, Amberley Road, Paddington, W.*

These traps of P form are made of lead with a good water seal cast in two pieces without ridges, and burnt together with its own metal. The smaller ones are fitted with brass screw caps at bottom.

American Drawn Lead Traps and Bends.—Du Bois' Patent.

G. Farmiloe & Sons, 34, *St. John Street, West Smithfield.*

George Jennings, *Stangate, S.E.*

These bends are made in a similar manner to drawn lead pipe; they have no seam, are uniform in thickness, and perfectly smooth inside and outside. The smaller pipes are made of 4½lb. lead, and the others of 6lb. or 8lb. if desired, and either of the P or S form. Brass screw-caps can be fitted if required.

Improved Cleaning Caps for Lead Traps and Soil Pipes, etc.

O. D. Ward, 182 *and* 183, *Upper Thames Street, E.C.*

These caps are made flush on the inside, and prevent the lodgment of soil, soap, hair, etc. *See Advertisement Appendix, page* 100.

American Bath, and Lavatory Valves, and Bib Range and Stop Valves.

G. Farmiloe & Sons, 34, *St. John Street, West Smithfield, E.C.*

These valves and cocks are made in gun-metal, highly finished and fitted with patent fibre seatings, and will stand either hot or cold water.

Non-Concussive, Vertical and Horizontal, and other Valves, Cocks, etc.

J. Tylor & Sons, *Newgate Street, E.C.*

Chandler's Patent Compound Lever Ball Valve.

Hayward, Tyler & Co., 84 *and* 85, *Upper Whitecross Street, E.C.*

The advantages claimed for this valve are, that it will resist a column of water of considerable pressure, with the ball lever less in length than any other valve, and owing to its construction and workmanship, little liable to get out of order, and repaired with readiness. It is specially adapted for the high-pressure system.

Shrewsbury Patent Ball Valves.

T. Gregory, *Station Road, Clapham Junction, S.W.*

These valves are made to close wholly by and with the stream, and being of metal and free from india-rubber seatings are not liable to get out of order.

Full-way Ball Valves.

O. D. Ward, 182 *and* 183, *Upper Thames Street, E.C.*

These valves are specially intended for water-waste cisterns where the supply is at a very low pressure, as two gallons can be obtained in less than one minute, with a head of three feet, so enabling two flushes to be used before leaving the closet. *See Advertisement Appendix, page* 100.

Patent Noiseless Inlet Water Valve.

RICHARD H. HUGHES, *Atlas Works, Hatton Garden, W.C.*

This valve is fixed at the bottom of the cistern, with a lever regulated by a copper floating ball. By this means the water is admitted noiselessly as a gently rising spring, disturbing no deposit that may be at the bottom of the cistern, and preserving the purity of the freshly admitted water. It is also less liable to be acted upon by frost than the ordinary ball cock, and therefore more secure in action.

The Atlas Patent Water Waste-Indicator.

R. H. HUGHES, *Atlas Works, Hatton Garden, W.C.*

This apparatus is to call audible attention to an overflow in tanks, cisterns, baths, and other receptacles for water, whether supplied from a Company's main or pumped by steam, gas, or hand. It consists of an alarm bell fixed in a conspicuous position, which is set in motion by a cog-wheel enclosed in a cage, and being acted upon by the water from the overflow or warning pipe, causes the bell to continue ringing until the overflow is stopped.

Water Meters.

J. TYLOR & SONS, *Newgate Street, E.C.*

Water Pressure Reducer.

T. LAMBERT & SONS, *Short Street, Lambeth, S.E.*

An apparatus for reducing the high pressure of the street main to low pressure in the house, whereby the ordinary pipes and fittings may be utilized.

Improved Ball Traps.

GEORGE JENNINGS, *Stangate, S.E.*

To prevent the waste-pipes which discharge over outside gullies from acting as flues through which air is drawn, frequently of an impure nature on account of the water in the gullies being stagnant or offensive, a trap is formed in which is placed an india-rubber ball, which rises when the water is discharged in the waste, and then immediately falls and so prevents the escape or return of obnoxious gases. *See Advertisement Appendix, page* 99.

Self-Closing Taps.—Whieldon & Beck's Patent.

COLLINGE ENGINEERING WORKS, 190, *Westminster Bridge Road, S.E.*

These taps are strongly made for high pressure, and opened by means of a spring, pressed between the thumb and the finger, or by raising a lever.

A ball valve is also made by this firm, simple in construction, and by the use of an india-rubber ring avoids sticking and setting fast, and is therefore not liable to get out of order.

Hydrants, and Hose Pipes, and Fittings.

J. TYLOR & SONS, *Newgate Street, E.C.*

Safety Valves for Kitchen Boilers, etc. — Randall's Patent Boiler Safety Valves and Taps.

J. WARNER & SONS, *The Crescent Foundry*, *Cripplegate*, *E.C.*

This valve is attached to an ordinary draw-off tap from the kitchen boiler, and so formed that when the circulating pipes become stopped, the valve opens and the heated water escapes. If desired, the valve can be placed on the top of the boiler instead of a draw-off cock. A spiral spring balances the pressure exerted on the boiler by the water in the circulating pipes when the column of water is very high.

Earthenware and Iron Urinals.

J. TYLOR & SONS, *Newgate Street*, *E.C.*
J. DODD, *Cable Street*, *Liverpool.*

Dodd's Improved Cast-iron Tip-up Lavatories.

JOHN DODD, *Cable Street*, *Liverpool.*

These lavatories are adapted for schools, barracks, etc., and consist of a range of tip-up basins, emptying into a horizontal waste-pipe. They are made with top, standards, etc., complete.

Dodd's Registered Polygonal Cabinet Lavatories

Are intended to obviate the use of curved or rounded woodwork. *See Advertisement Appendix, page* 121.

Cast Iron Lavatories and Water Basins.

J. TYLOR & SONS, *Newgate Street*, *E.C.*

Shrewsbury Patent Wasteless Lavatory.

T. GREGORY, *Station Road*, *Clapham Junction.*

Instead of a tip-up lavatory basin which is considered objectionable on account of the difficulty to prevent an accumulation of soap, this lavatory is hinged and made to lift up as a lid and discharge the contents of the basin into the drain. It is fitted with a water waste-preventor which prevents danger from overflow.

Patent Shower and Spray Shampooing Apparatus.

GEORGE JENNINGS, *Stangate*, *S.E.*

In addition to the ordinary lavatory supplies of hot and cold water, this apparatus is fitted with a movable swan-neck arm with a rose head, and arranged to give a shower or spray, cold, tepid, or hot, as desired. *See Advertisement Appendix, page* 99.

Improved Patent Sink.

GEORGE JENNINGS, *Stangate*, *S.E.*

This sink is formed of galvanized or enamelled iron. In place of the ordinary grating, a slot is provided its whole length, which allows the water to pass freely and quickly away, and prevents small articles from entering the drain. By lowering the stand-pipe, the sink may be used as a washing tub or child's bath, or as a butler's sink. *See Advertisement Appendix, page* 99..

Cast Iron Slop Sink.

J. Tylor & Sons, *Newgate Street, E.C.*

Patent Hospital Slop Sink and Wash-up Trough.

J. G. Stidder & Co., *Southwark Bridge Road, S.E.*

This fitting consists of a wash-up trough supplied with hot and cold water, with patent soap trap under, and also a slop sink with inspection door.

Baths.—Copper, Enamelled Iron, etc., and Valves.

J. Tylor & Sons, *Newgate Street, E.C.*

General Iron Foundry Company, 41, *Upper Thames Street, E.C.*

Stevens' Patent Bath.

Stevens Bros. & Co., 35 *and* 36, *Upper Thames Street, E.C.*

This bath is made complete with fittings, and soap tray inside for convenience to the bather. In case of the valves becoming leaky, the water falls into the bath where it cannot do damage. The enamel is of such a nature that it expands and contracts with the iron when used with hot water.

The "Acme" Combined Needle and Plunge Bath.

Henry Conolly, 53 *and* 55, *Hampstead Road, N.W.*

In addition to the ordinary bath, this invention consists of a spray or needle bath, with shower and douche combined, and arranged so that a full length bath with either or all the above, cold, tepid, or hot may be obtained. The head of the bath is enclosed on three sides with framing in the form of a cupboard, and the taps for each bath are placed similarly to the stops of an organ.

The "Bachelor's" Combined Bath.

Henry Conolly, 53 *and* 55, *Hampstead Road, N.W.*

This bath is arranged as a cold douche, a hot, tepid, or cold shower spray, wave, or sitz, for standing only, and is enclosed with mahogany or other framing similar in appearance and size to a wardrobe, and is useful where there is not space for an ordinary bath.

Patent Asbestos Covering for Steam and Water Pipes.

John Bell, 118, *Southwark Street, S.E.*

A flexible asbestos millboard—specially prepared so as not to tear—is wrapped round the pipe, over which is placed hair felting, and the whole enclosed in oilcloth. This coating prevents the escape of heat, and is also a preservative against frost. A composition is prepared for coating steam boilers, which preserves them from rust and unequal expansion and contraction, as well as preventing loss of heat.

WATER CLOSETS AND SUPPLIES.

Moule's Patent Earth Closet.

MOULE'S PATENT EARTH CLOSET COMPANY, 5A, *Garrick Street, Covent Garden, W.C.*

Acting on the principle that dry earth is the best deodorizer, and at the same time absorbing valuable excretive for fertilizing purposes, these closets are fitted with a receptacle for dried earth, which is discharged into a movable pail under the seat by the usual process of raising a handle. They are made in various forms, and are least objectionable when the pail can be removed and the earth replenished from outside a building.

Gibson's Patent Earth Closet and Commode,

Station Road, Clapham Junction, S. W.

The system adopted in these closets is to separate the liquids from the solids, the former passing into a drain, and the latter collected into a pail or receptacle. The seat is arranged to cause the apparatus to be self-acting and preventing waste by allowing only sufficient earth to be discharged at each time of use. The separation of the fluid from the solid prevents the usual disagreeable smell, and renders the contents of the reservoir more valuable than otherwise.

Parker's Patent Automatic Earth Closets and Inodorous Commodes,

Woodstock, Oxford.

To ensure the soil being properly covered with earth, and to prevent nuisance and disease, the maker has invented this closet, which works automatically, discharging a supply of earth immediately upon each use of the closet.

Baird's Patent Earth Closets.

COLLINGE ENGINEERING WORKS, 190, *Westminster Bridge Road, S.E.*

This apparatus consists of a cast-iron frame supporting a valve arranged to form a measure, so that a sufficient quantity of earth is distributed each time of use. It is self-acting, and is supplied with a small iron waggon on wheels, to contain enough for twelve to fourteen uses.

Patent Pan Closet Container Flushes.

J. TYLOR & SONS, 2, *Newgate Street, E.C.*

This consists of a fan-shaped tube perforated and fixed round the basin in direct connection with the supply-pipe. This is to obviate the objection of the ordinary flush to the pan closet, which drives the air in the container into the house and causes smell. *See Advertisement Appendix, page* 115.

Improved Pan Closets.

WARNER AND SON, *The Crescent, Cripplegate, E.C.*

The objection to the ordinary pan closet, viz., the corrosion and fouling of the iron container, is overcome in these closets, by the substitution of china for the iron containers.

Warner's Patent Special Valve Closet.

The Crescent, Cripplegate, E.C.

A valve closet fitted with Bower's patent overflow sewer-gas trap, and patent supply valve with copper-case pneumatic regulator; the action is noiseless. It may be used without a trap when the soil-pipes are ventilated.

Patent Improved Bramah Valve Closet.

GEORGE JENNINGS, *Stangate, S.E.*

The improvement in this valve closet consists of a water waste-preventing apparatus under the seat, which only allows a sufficient quantity of water to enter the basin, and will flow in although the plug falls. It also provides an after-flush. *See Advertisement Appendix, page* 99.

Patent Valve Closet and Trap.

GEORGE JENNINGS, *Stangate, S. E.*

These closets and traps are made either in one piece of earthenware or the traps may be in galvanized iron. The plug is trapped and fitted with an india-rubber ball, so that when the handle is raised the ball effectually prevents any smell from the soil pipe or trap passing into the house. The trap is fitted with a ventilating pipe to prevent syphonage and to ease the pressure of gas in the soil pipe. *See Advertisement Appendix, page* 99.

Patent Trapless Valve Water Closet.

GEORGE JENNINGS, *Stangate, S.E.*

By the use of this closet the ordinary trap is dispensed with. The discharge from the closet is passed into the soil-pipe, which is carried above the house the full bore, the water rushing down prevents any upcast. To guard against gas entering the house when the plug is raised, Jennings' patent ball trap is used. *See Advertisement Appendix, page* 99.

Patent Clear-way Water-Closets.

J. TYLOR & SONS, 2, *Newgate Street, E.C.*

This is a valve-closet, fitted with perfectly flushed basin (without fan) trapped overflow, charged each time, and an extra large outlet. *See Advertisement Appendix, page* 115.

Patent Side-outlet Valve Water Closet.

J. TYLOR & SONS, *Newgate Street, E.C.*

This closet has no trap, but is arranged for a sufficient quantity of water in the basin to trap it, the outlet-valve acting as an overflow escape. When the handle is pulled up, the valve is raised clear of the discharge passage, and when let go, the outlet is closed, and the closet sealed by the after-flush. A self-acting arrangement guards against a failure in the water supply, and the entrance of sewer gas into the house. Provision is made for a ventilating-pipe over soil-pipe. *See Advertisement Appendix, page* 115.

Pearson's Patent Trapless "Twin Basin" Water Closet.

Capper, Son & Co., 69, *Gracechurch Street, E.C.*

This closet is made in one piece of earthenware, and consists of a pan in which is a dip to form a trap. The soil is discharged by raising a plug or plunger which is immediately over the soil pipe. When allowed to fall, a quantity of water is admitted into the pan and regulated by a ball valve. The advantages claimed are simplicity in construction, cleanliness, and protection from sewer gas.

Bostel's Patent Brighton "Excelsior" Water Closet.

D. T. Bostel, 8 *and* 10, *Golden Lane, E.C.*

This closet is made with trap complete in one piece of glazed earthenware, and the plug being immediately over the outlet allows the soil-pipe or drain to be easily cleared with the plumber's plunger. An outlet above the trap provides an overflow and fresh-air inlet. A flushing rim all round the basin affords means for complete cleansing.

Banner's Patent Earthenware Closet.

John Bolding & Sons, *South Molton Street, W.*

This apparatus is made in parts, and easy of cleansing and renewal. The receiver is made of earthenware, with inlet for water; the upper part is formed as a channel, into which the rim of the basin drops, and being filled with water, prevents any gas in the receiver from rising. The saucer is also of earthenware, and raised by a lever in the ordinary manner. An outlet arm in the receiver affords constant ventilation.

Patent Infirmary Closet.

J. G. Stidder & Co., *Southwark Bridge Road, S.E.*

These closets are made with an extra large flushing rim, with an inspection door above trap. The traps being five inches diameter, allow a free passage, and are especially advantageous in factories or places where a quantity of paper is used.

Patent Holborn Closet.

J. G. Stidder & Co., *Southwark Bridge Road, S.E.*

These closets are made in a single piece of Staffordshire ware, trapped above the floor line, and fitted with an inspection door for clearing out trap and drain.

Patent Double Inlet, or Water Battery Water Closet Basin.

Dent & Hellyer, *Newcastle Street, Strand, W.C.*

This basin is similar in principle to the wash-out basin, but made to retain a body of water. The water being brought in on the opposite side to the outlet, drives everything out of the basin. There is also a flushing pipe round the rim.

Patent Direct-Action Water Closet.

BRAZIER & SON, 106, *Blackfriars Road, S.E.*

This consists of an earthenware pan, fixed with an S or P trap, containing a good depth of water, and provided with a ventilating pipe from the trap. It is free from valves and metal work, and useful for hard wear. *See Advertisement Appendix, page* 114.

"Carmichael" Wash-down Accessible Water Closet.

ROBERT BROWN AND SON, *Paisley.*

These closets, patented by Mr. Buchan, are formed of earthenware in one or two pieces, and consist of a basin so curved as to form a syphon trap with outlets to suit the position of the soil pipe. The flushing pipe is arranged that it at once clears off the paper and soil, and at the same time the pan is cleansed all round.

Dodd's Patent Ventilated Water Closet.

JOHN DODD, *Thomas Street, Liverpool.*

This closet is designed on the wash-out principle and made with trap, either in one piece or separate. The special features of the closet are that ventilation is provided immediately over the outlet, which relieves the pressure of sewer gas, and prevents the closet being syphoned or trapped. The outlet being in front is less offensive than in any other position, and at once carries off the urine. It also allows of a good flush by fixing the service-pipe at the back. *See Advertisement Appendix, page* 121.

"Shrewsbury" Patent Valveless Closet and "Perfect" Water Waste-Preventor.

T. GREGORY, *Clapham Junction.*

An earthenware pan and syphon trap in one piece, with a ventilating pipe from the top of the syphon. The water waste-preventor consists of a trough or tray into which a sufficient quantity of water is admitted regulated by a ball valve. By pulling down a handle the contents are at once discharged through a large pipe into the pan. The absence of valves renders the arrangement simple.

The Household Closet.

O. D. WARD, 182 *and* 183, *Upper Thames Street, E.C.*

This closet, while retaining the simplicity of the Hopper Closet, provides sufficient water in the bottom of the pan to prevent the soiling of the outlet. The trap and flushing-rim allow the soil and paper to be effectually flushed at each discharge of the cistern. This closet is also made with an earthenware top, to serve also as a slop sink, the seat of the closet being hinged as a flap.

An important improvement in the connection of the lead soil-pipe with the stoneware trap is obtained by a stoneware collar through which the soil-pipe passes, and being flanged at the top forms a washer between the cap and the socket, which are then securely bolted together. *See Advertisement Appendix, page* 100.

The "National" Patent Side Outlet Closet and Trap.

W. T. WHITE & Co., *London and North-Western Goods Yard, Worship Street, E.C.*

This closet is made either with a trap complete or the pan alone, to fit into an ordinary S or P trap. The outlet is placed at the side of the basin which contains a body of water 1½ inch deep in the bottom to receive the soil. It is made in white, blue, and printed earthenware. The trap is fitted with an outlet to allow of a ventilating pipe being attached.

Woodward Patent "Wash-Out" Closet.

Swadlincote, near Burton-on-Trent.

An earthenware pan containing about one and a half inch of water, of large area, with an outlet at the side near the bottom. It can be fixed either upon an **S** trap or a movable earthenware stand, and readily arranged for the outlet to be in any position best suited for the drains.

Improved Flush and Discharge Latrines.

J. G. STIDDER & Co., *Southwark Bridge Road, S.E.*

These consist of a number of stoneware basins, retaining a large quantity ot water, connected with a stoneware discharge pipe passing through a trap into the drain. An iron standing waste contains a self-acting flush valve, which allows the contents of the pipe to be discharged when desired.

Patent Self-Acting Aromatic and Deodorizing Water Closet and Drain Purifier.

BRAZIER & SON, 106, *Blackfriars Road, S.E.*

This closet consists of an earthenware pan fitting into an S trap, with a chamber at the side in which is placed camphor and lime. Each flush passing through the closet quickly becomes clear lime water impregnated with camphor, which is a powerful disinfectant. *See Advertisement Appendix, page* 114.

Patent Syphon Disinfector.

EDWARD WARNER, *Stowmarket, Suffolk.*

The object of this invention is to render gases arising from water closets, etc' harmless. It consists of a glass reservoir connected with a small glass cistern below, by means of a pipe which receives a sufficient quantity of fluid to be used at each delivery. The raising of the plug causes a supply of water to enter the cistern, which flows into the water-closet basin when the plug is lowered, thereby disinfecting any gases that may escape into the pan. The action is automatic and is easily replenished.

Cast Iron Urinals.

STEVENS BROS. & Co., 35 *and* 36, *Upper Thames Street, E.C.*

The Self-Cleansing Trough Closet, and Urinals.

BOWES, SCOTT, & READ, *Broadway Chambers, Westminster, S.W.*

The trough closet is made of glazed or enamelled stoneware, and always contains a quantity of water. By the use of Rogers Field's patent self-acting annular syphon (elsewhere described) a periodical discharge of clean water takes place which washes the soil in the trough through an outlet at the other end. Urinals are made on a similar principle, and means are provided for flushing the back and foot stone.

Patent Dry-Earth Urinals.

COLLINGE ENGINEERING WORKS, 190, *Westminster Bridge Road, S.E.*

A receptacle for dry earth is formed at the back of the urinal, which is discharged by a self-acting treadle arrangement into a small hopper, and mixing with the urine falls into a movable tank. A valuable manure is produced and the earth is said to destroy all offensive smells.

Self-trapped Flushing Rim Bedford Urinals.

BRAZIER & SON, 106, *Blackfriars Road, S.E.*

These urinals being trapped in the basin require no trap in the waste-pipe, and a cane can be passed into the drain, without disconnecting any parts Clean water is always left after flushing, thus preventing unpleasant smells. *See Advertisement Appendix, page* 114.

Concealed Wall Urinal.

J. G. STIDDER & CO., *Southwark Bridge Road, S.E.*

This urinal is a small elongated basin working upon a pivot in an aperture in the wall. In drawing it out a valve is opened and a flush of water continues until it is pushed back into the wall.

Patent Victoria Urinette.

J. G. STIDDER & CO., *Southwark Bridge Road, S.E.*

This ladies' convenience consists of a pottery basin inserted in wood frame, with self-acting flushing valve.

Intermittent Flushing Cisterns.

O. D. WARD, 182 *and* 183, *Upper Thames Street, E.C.*

The "Vade Mecum" cisterns are especially suitable for urinals. They are fed by a tap regulated according to the supply required, and discharged through a syphon pipe every quarter of an hour, or other appointed time. *See Advertisement Appendix, page* 100.

Patent Water-Waste Preventor Valves.

T. LAMBERT & SONS, *Short Street, Lambeth, S.E.*

The valve may be applied to cisterns regulated to supply two gallons of water at each action. Another arrangement allows its use under the water closet seat; the valve opens and delivers the necessary flush, and then closes; or it may be used in connection with a closet door. If desired, the valve can be supplied direct from the main. As a draw-off tap it may be opened and closed at pleasure, but if left open will close itself as soon as two gallons have passed through it.

Shank's Patent "Pump" Water Waste Preventors.

HAYWARD, TYLER & CO., 84 *and* 85, *Upper Whitecross Street, E.C.*

A Cylinder is fixed in an ordinary supply cistern, which acts as a pump having a loose rising disc instead of bucket and valves. When the handle is pulled, the water is thrown into the closet with any degree of force, according to the strength of the pull.

Patent "Waste-Not" Cistern Valve.

J. TYLOR & SONS, 2, *Newgate Street, E.C.*

This apparatus is made to fix in cisterns under water and arranged to discharge two gallons or less at each action of the closet. It consists of a brass plunger which being raised allows of the discharge of the water. It then falls and gives admission to the regulated quantity of water ready for the next action. *See Advertisement Appendix, page* 115.

Patent "Waste-Not" Regulator with After-Flush for Trapping.

J. TYLOR & SONS, 2, *Newgate Street, E.C.*

This apparatus is arranged for fixing under the seat of the closet. When the plug is raised it allows a regulated quantity of water to pass into the basin, and no more, however long the plug continues up. When the handle falls a quantity of water is allowed to flow into the basin, and thus ensure an after-flush. *See Advertisement Appendix, page* 116.

Chandler's Patent Flushing Cistern.

T. LAMBERT & SONS, *Short Street, Lambeth, S.E.*

This is a cast-iron cistern without a division, and in addition to a ball valve, has a second valve attached thereto. This allows of the water from the main cistern being shut off before that in the waste preventing cistern is discharged. It is said to be little likely to get out of order, durable, and easy of repair. A trapping box is also provided to prevent any gas from entering the cistern from the water closet.

Lambert's Double-Valve Supply Cistern.

Short Street, Lambeth, S.E.

A cast-iron cistern to contain three or six gallons of water, arranged to deliver two gallons at a flush. It is so constructed as to prevent water running to waste, and adapted for either high or low pressure.

Tozer's Patent Single Valve Service Box.

G. FARMILOE & SONS, 34, *St. John Street, West Smithfield, E.C.*

This service box is made in two compartments. When the handle of the W.C. is raised it acts upon a ball-lever, which opens a valve and allows a sufficient quantity of water to pass into the closet for sluicing. When the handle falls, a quantity of water for trapping passes slowly into the pan from a small chamber divided from the other.

Patent Infallible Water Waste-Preventor and Measuring Apparatus.

PONTIFEX & WOOD, *Shoe Lane, E.C.*

This preventor consists of a cylinder containing a movable piston; the water is supplied through a pipe at each end of the cylinder with a four-way cock in the centre. By turning this a quarter round the supply goes in at one end, and by forcing the piston down allows a sufficient quantity of water to be discharged, which may be regulated at pleasure. As the discharge is alternate at top and bottom, there is always a supply in the cylinder. The apparatus can be fixed vertically, or horizontally under the seat of the closet, and is adapted for high-pressure service.

Patent "Acme" Syphon Water-Waste Preventor.

CHARLES WINN & CO., *Birmingham.*

This cistern is made in plain cast or galvanized iron, in which is placed a tube of syphon form. By pulling the lever the cap is raised and the syphon charged, and although the lever may be released, the full quantity (usually two gallons) continues to run until the cistern is empty, the velocity of the flush being said to increase to the end of the discharge. The absence of valves renders it little likely to get out of order. It is specially useful where wash-out closets are used, and is authorized by all of the water companies. *See Advertisement Appendix, page* 116.

Water Waste Preventors.—Bean's Patent Direct-acting Valveless Waste Preventors.

O. D. WARD, 182 *and* 183, *Upper Thames Street, E.C.*

This apparatus secures the instantaneous and automatic discharge of the contents of the cistern with great force, and by the direct acting of the syphon, delay and waste of flush are avoided. It is especially suitable where a low head is necessary. *See Advertisement Appendix, page* 100.

Patent Syphon for Water Closets and Urinal Cisterns.

H. BRAITHWAITE & CO., *Swinegate, Leeds.*

The syphon is applied to an ordinary cistern divided into two compartments with a small communication, the outer one having the ball tap and the inner one regulating the supply. The service pipe is brought over the latter compartment and into a cylinder in which a piston works, regulated by a weighted lever. This being raised forces the water into the pipe and sets the syphon in motion. As soon, therefore, as the handle is raised, even if let go, the full discharge into the closet takes place.

Double Chamber Syphon Water Waste-Preventor Cistern.

BRAZIER & SON, 106, *Blackfriars Road, S.E.*

The advantages claimed for this preventor are that two gallons of water are discharged at each flush although the pull is released, and that by the syphon arrangement it is delivered with equal force from beginning to end, and that the refilling is silent. Another preventor is made by this firm also on the syphon principle, specially adapted for urinals and flushing rim basins, simple in principle and free from valves, etc. *See Advertisement Appendix, page* 114.

Syphon Water Waste-Preventor.

Henry Conolly, 53 *and* 55, *Hampstead Road, N.W.*

This preventor being free from iron levers and cranks is noiseless in action. It consists of a float worked by a pull. When used the float is drawn down and the water discharged with great rapidity. It is useful for wash out closets generally.

Perfect Water Waste-Preventor.

T. H. P. Dennis, *Chelmsford; and Mansion House Buildings, E.C.*

A cast-iron cistern containing two compartments, one fitted with a ball-cock in the usual manner and communicating with the other by a small orifice in the division. This compartment has a small well under, in which is placed a syphon connected with the water-closet supply. When the handle is raised, the water is forced through the syphon into the closet, giving a full and perfect flush.

The "Acme" Antiseptic Water-Waste Preventor.

Antiseptic Manufacturing Company, 46, *Queen Victoria Street, E.C.*

This waste preventor is constructed on the syphon principle, and provided with a chamber to contain a powerful disinfectant—one charge of which is injected into the water each time of discharge.

The Automatic Flushing and Antiseptic Tank.

This apparatus is supplied from the main or otherwise, to discharge automatically at regulated periods, the water being charged with antiseptic fluid.

Water Closet Ventilation.—Patent "Duplex" Lid.

E. Howard, 1a, *Upper Baker Street, N.W.*

At the back of water closets, slop sinks, etc., an open grating the full width of the opening and eighteen inches high is inserted in the outer wall. The lid is so contrived that when shut down the water closet is exposed to the outer air, but when in use it is lifted in the ordinary manner, and closes the opening in the wall.

VENTILATION.

Iron Air-Bricks, Ventilators, etc.

Hayward Brothers & Eckstein, *Blackfriars Road.*
Hart, Son, Peard & Co., *Wych Street, W.C.*
General Iron Foundry, 41, *Upper Thames Street, S.E.*

Air-Inlet Tubes.

R. Boyle & Son, 64, *Holborn Viaduct, E.C.*

These consist of vertical tubes of any size desired, fitted with regulating valves and sieves or water boxes, with deflecting plates for the purpose of purifying the air, and freeing it from blacks. *See Advertisement on Front Cover.*

Patent Vertical Pipes for admitting Fresh Air.

Shillito & Shorland, *Stretford Road, Manchester.*

Fresh air is admitted from without at the floor level by a perforated grating in wall, and passing through wire sieves deposits foreign matter in a movable box. The air being thus cleansed enters vertical tubes, and is delivered about six feet from the floor in a spray towards the ceiling. The pipes are made of various sizes and forms to suit the several apartments, and fitted with a valve to regulate the supply.

The Æolus, or Waterspray Ventilator.

The General Ventilating Company, Limited, 135, *High Holborn, W.C.*

This apparatus consists of a pedestal in which is a waterspray; this, acting with a suction force, draws the air either from within the room or from the outside of the building, and being cleansed by the water, passes into the room with an upward current. In winter the temperature of the air may be raised by a gas furnace, and in summer cooled by passing over ice. The same principle is adopted to produce exhaust-ventilators, and also for the double action. *See Advertisement Appendix, page* 116.

Patent Ventilator, or Air Propeller.

Verity Brothers, 127, *Regent Street, W.*

This apparatus consists of a small drum, on which is a set of fans worked by a fly-wheel, driven by a jet of water. By this means a large quantity of air can be passed into a building, and by reversing the motion the same apparatus may be applied as an equally powerful extractor; or one of each may be used for admission and extraction of air. By passing the air through a stove it may be warmed to any desired temperature, and in the summer passed over ice before entering the apartment. A box is also added for the introduction of disinfectants or medicinal substances. The water, after working the machine, passes down through minute orifices and washes the incoming air.

Sheringham's Inlet Ventilator.

This consists of an iron box with a hopper front which may be opened and closed at pleasure by a balance weight. The box is fixed in an external wall, and an iron air-brick on the outside allows the entrance of fresh air along the ceiling without draught.

Hayward Brothers and Eckstein, 187 *to* 193, *Blackfriars Road, S.E.*
Hart, Son, Peard & Co., *Wych Street, W.C.*
St. Pancras Iron Works, N.W.
General Iron Foundry Company, 41, *Upper Thames Street, E.C.*

Improved Fresh Air Ventilators.

NETTLEFOLD & SONS, 54, *High Holborn, W.C.*

To avoid the unsightliness of the front of a ventilator falling partly into the room, this ventilator is made as a box, with an ornamental front, within which is a flap fitted with cord and pulley, and regulated with balance-weight.

McHaffie's Patent Self-acting Fresh Air Ventilators.

HART, SON, PEARD & CO., *Wych Street, W.C.*

This ventilator consists of an iron box fixed in an external wall, in which is a throttle valve fitted with a balance weight. The external air acts upon the valve, and whether the current is strong or gentle, the passage of an equal quantity of air into the apartment is ensured. *See Advertisement Appendix, page* 105.

Patent Conical Ventilators.

J. E. ELLISON, *Victoria Square, Leeds.*

These ventilators are made in stoneware of the size of ordinary bricks, or larger, if required, in which are formed holes, conical in shape. The smaller opening being placed on the outside, the air entering the room is diffused, so that draught is avoided. They may be used with advantage behind hot-water pipes.

Patent "Radiator" Ventilator.

J. E. ELLISON, *Victoria Square, Leeds.*

This ventilator is composed of a flat disc, with divisions behind placed crossways, which on closing the ventilator, slide into a box fixed in the wall. By means of the wedge-shaped compartments the incoming air is dispersed in all directions, so that no draught is experienced. The ventilators may be fixed from 4-ft. to 8-ft. above the floor. The fresh air is supplied direct from the outside, or from a flue in which may be arranged means for warming the air.

Air Cleansing Prisms.

RENTON GIBBS, *Mill Street, Liverpool.*

An apparatus for cooling, cleansing, and purifying air, especially suitable for hospital windows, etc. It consists of a series of V-shaped horizontal glass troughs, fitted in a frame which can take the place of the window. Water is allowed to enter this frame at the top, and filling and overflowing each of the troughs passes away at the bottom. The air passing through and over the falling water is cooled, cleansed, and purified, and if desired a disinfectant or perfume can be used instead of water. The troughs can be made to close similar to a Venetian blind to prevent the admission of air.

Æolus Patent Deflecting and Injecting Automatic Roof Ventilator.

GENERAL VENTILATING COMPANY, LIMITED, 235, *High Holborn, W.C.*

This cowl is a combination of the two systems of injection and deflection. The head is a windcatcher and downcast ventilator; the centre, a series of curved baffle plates, to deflect adverse currents and assist in the extraction of the vitiated air from the main shaft, which is already commenced by the injected currents from the downcast ventilator. It is made for soil-pipes and for ventilating large rooms. *See Advertisement Appendix, page* 116.

Patent Downcast Ventilator.

R. Boyle & Son, 64, *Holborn Viaduct, E.C.*

This appliance is so constructed that it presents an opening or mouth on the principle of the wind sail, to the wind, from whatever direction it may blow, and equally utilizes a downward current. It is carried from the roof by means of a shaft to the room to be ventilated, about 4-ft. 6-in. from floor, and returned to give the air an upward direction. It is especially useful for buildings closely surrounded by higher buildings, and where air cannot be admitted through the walls. *See Advertisement on Front Cover.*

Improved Air Cooler.

R. Boyle & Son, 64, *Holborn Viaduct, E.C.*

This arrangement for cooling and purifying fresh air consists of an air inlet tube, with an outer casing packed with a non-conducting substance, to prevent the heat from the wall penetrating into the interior and acting upon the blocks of ice, which are placed in a movable drawer—the front of which is also double. The outer air entering through a grating is deflected by a metal shield on to the suspended block of ice, and thence to the ice in the drawer, and up the tube into the room, after being cooled and purified. *See Advertisement on Front Cover.*

Patent Air Warmer.

R. Boyle & Son, 64, *Holborn Viaduct, E.C.*

This arrangement for supplying air to buildings consists of a pipe placed in an inlet tube, made " zig-zag " shape, causing the incoming air to repeatedly inpinge upon it in its passage through the tube. At the bottom is an air-tight chamber, in which a Bunsen burner is placed, the flame of which plays up one end of the pipe; the other end may dip into a condensation box, or be continued up into a flue or extraction shaft. The condensed vapour can be carried off by means of a pipe through the external wall, and any products of combustion which may arise are absorbed by passing through charcoal. *See Advertisement on Front Cover.*

Watson's Double Current Syphon Ventilators.

Hill & Hey, *Halifax, Yorkshire.*

By means of a division in the throat of the tube forming a syphon, fresh air is allowed to enter and at the same time enable the foul air to escape. It is made of zinc or wood in various forms and designs to suit the character of the building.

"Excelsior" Syphon Ventilators.

HILL & HEY, *Halifax, Yorkshire.*

The syphon ventilator is so arranged that the effect of the wind is reduced to a minimum without interfering with the free action of the ventilator; thus it adjusts itself automatically to the demand, and as the Ventilator serves the double purpose of introducing fresh, as well as extracting foul air, it allows of inlets below to be dispensed with. The ventilators are applicable to the roofs and suited to the character of the buildings.

The single current ventilators are on the same system, but for extraction only. *See Advertisement Appendix, page* 120.

Syphon Wall Ventilators.

LAWSON & HAINSWORTH, *Halifax, Yorkshire.*

An air-brick ventilator fitted with a balance valve, which closes to an incoming current and opens to the out. Also roof and turret ventilators, on the syphon principle, allowing an outlet and inlet for air without draught.

Inlet and Outlet Ventilators.

C. KITE & CO., 117, *Chalton Street, Euston Road, N.W.*

The Inlet Ventilator consists of a box to be fixed in an external wall, in which are two vertical baffle plates. The direct air from without is checked by these plates, and delivered into the room in an upward direction through a hinged hopper front without draught.

The Chimney-breast Ventilator is constructed on the principle of the Patent Exhaust-Roof Ventilator for extracting the vitiated air in the upper part of the room into the smoke flue.

Smoke and Ventilating Flues.—Boyd's Patent.

Maddox Street, Regent Street, W.

This system consists of cast-iron plates built and tied into the brickwork of a chimney, dividing the flue into two portions; one for the conveyance of the smoke, and the other for removal of vitiated air. The iron plates conduct considerable warmth from the smoke to the ventilating flues, thereby rarefying the air and preventing down-draught. Inlets are formed either immediately below the cornice or from the ceiling flower, and the outlet is through louvred gratings fixed on each side of the flue beneath the head of the chimney stack.

Thompson's Patent Mercurial Valve.

COPE & COLLINSON, 61, *Sumner Row, Birmingham.*

To provide a means of keeping rooms and buildings at an even temperature, a balanced valve is fixed in a flue near the ceiling, to which is attached a weight which floats in a tube containing mercury. As the temperature of the room increases, it causes the air in the tube to swell, and the mercury confined therein rises, which opens the valve to the required distance and falls as the room cools.

Wall-Faced Ventilator.

D. O. Boyd, 19 *and* 23A, *Maddox Street, W.*

This ventilator consists of an iron grating, with a hinged flap to be fixed in an extraction flue, under which is a small hood, enclosing a Bunsen air and gas burner, which produces a constant up-current. Another form of ventilator, but projecting slightly into the room, allows of flues for vitiated air being constructed in walls one-and-half brick thick.

Ceiling ventilators are also made for upper rooms, to discharge into the space in roof, and consist of hinged flaps, regulated by lines and pulleys.

Mica Flap Outlet Ventilators.

Hayward Brothers & Eckstein, 187 *to* 193, *Union Street, Borough, S.E.*

These outlet ventilators, patented by Mr. Boyle, consist of an iron box with trellis front, behind which are shutters or valves composed of mica, and are so sensitive that they open with the slightest appreciable up-current, and close against down-draughts to exhaust the foul air from the upper portion of the room. They are specially useful to fix in chimney flues, as they prevent smoke from entering the room. *See Advertisement Appendix, page* 108.

Dr. Arnott's Chimney Valve for discharge of Heated Air.

Hart, Son, Peard & Co., *Wych Street, W.C.*

This ventilator is intended to be fixed in the chimney flue near the ceiling. It is fitted with a carefully balanced valve, which opens with the least draught, and from the heat in the chimney, causes a powerful up-draught when the fire is alight. A silk flap at the back prevents any smoke from entering the room. *See Advertisement Appendix, page* 105.

Boyle's Patent Ventilators.

Comyn, Ching & Co., 22 *and* 23, *Little St. Andrew Street, Upper St. Martin's Lane, W.C.*

This system of ventilation consists in the admission of fresh air from the outside of the house by means of a small tube, circular on the inside, and of draughtless character, and fixed in the skirting. Also a ventilator fixed in the upper part of the room to communicate with the smoke or other flues, or external air, which, being fitted with valves composed of mica, are so sensitive that they act with the slightest appreciable motion of air. By the use of the above, the air in the room is kept in a state of motion and constant change, but without draught. Turret ventilators are made on the same principle.

Patent Induced-Current Fixed Ventilator.

W. P. Buchan, 21, *Renfrew Street, Glasgow.*

This ventilator is self-acting, and consists of a number of vertical plates surrounding a square tube partially perforated upon its four sides. The wind rushing past, draws out with it the air contained in the shaft, and so causes a powerful up-current. It is made in various forms, and in sizes varying from six to sixty inches in diameter, and equally suitable for the ventilation of soil-pipes and sewers, as for rooms and public buildings. *See Advertisement Appendix, page* 116.

Improved Concentric Tubes.

R. Boyle & Son, 64, *Holborn Viaduct, E.C.*

The invention is to draw off the heat and products of combustion. It consists of double pipes with spaces between, packed with a non-conducting substance, which prevents the radiation of heat, and reduces condensation to a minimum. The tubes are fixed over gas lights, and let into a ventilation shaft connected with an air-pump ventilator on the roof. *See Advertisement on Front Cover.*

Roof Ventilators.

C. Kite & Co., Patentees, 117, *Chalton Street, Euston Road, N.W.*

This ventilator, of louvre form, is especially adapted to fix on ridges with vertical divisions; by the action of the wind it becomes a powerful exhaust for drawing off vitiated air. In case of down-draught, a valve is provided which can be opened and shut at pleasure.

A ventilator on the same principle is designed as a Dormer.

Æolus Patent Invisible Automatic Exhaust Roof Ventilator.

General Ventilating Company, 235, *High Holborn, W.C.*

This invention consists of a downcast ventilator set anglewise on roof just below the ridge, from which a shaft descends and turns right and left into a main trunk which receives the vitiated air from the room. The two ends are open and communicate with other trunks at right angles, open to the air. Any current striking on the downcast ventilator, rushes down the vertical tube and turns right and left, inducing a current from the room to be ventilated. This ventilator causes no interference with the appearance of the roof. *See Advertisement Appendix, page* 116.

Patent Triumph Ventilators.

J. M. Lamb & Co., 119, *Finchley Road, N.W.*

These ventilators for soil pipes and large and small rooms are similar in design to the smoke cure made by the same firm, and create a powerful up-current in all weathers.

Boyle's Patent Self-Acting Air-Pump Ventilators.

R. Boyle & Son, 64, *Holborn Viaduct, E.C., and Glasgow.*

These ventilators are made in galvanized iron, and may be fixed on the ridge or other parts of a roof. They are constructed with an internal tube or shaft, divided into four compartments, outside of which are plates so arranged as to prevent down-draught, and enclosed with iron plates with openings between. The external air impinging on one of the internal plates, creates an induced current, and in its passage drawing the air from one of the chambers in the shaft, expels it at the opposite opening. *See Advertisement on Front Cover.*

Patent Revolving Archimedean Screw Ventilators and Smoke Conductors.

T. B. CHARLESWORTH, 17, *New Bridge Street*, *Blackfriars*, *E.C.*

These ventilators and smoke conductors are made with a revolving hood with flanges all round, which is attached to an Archimedean screw working in the shaft of the ventilator. The least movement of the air causes the hood to revolve, and this acting on the screw draws up vitiated air and smoke, and prevents down-draught.

Norton House and Ship Ventilator.

NORTON VENTILATOR COMPANY, LIMITED, 84, *Cannon Street*, *E.C.*

An apparatus for expelling foul air from large halls, factories, etc., or from a number of rooms. Pipes are laid from the ceilings or other parts of the room which communicate with a water-bell or air-chamber, the bell being raised by steam, gas, or water engine, or other motor, causing a partial vacuum, draws up the foul air; on the return or downward stroke of the bell the exhaust valve closes, and the foul air which has filled the bell is forced out through the discharge valve chamber and pipe. The rapidity of the action of this apparatus causes a constant clearance of foul air.

Nonpareil Ventilator and Smoke Conductor.—Hawksley's Patent.

T. B. CHARLESWORTH, 17, *New Bridge Street*, *E.C.*

These ventilators and smoke conductors are made to fix on the flues or roofs of buildings and consist of a number of flanges, made hopper fashion so that the air from whatever quarter impinging upon the louvres, causes an upward current.

The Æolus Chimney Cowl.

GENERAL VENTILATING COMPANY, 235, *High Holborn*, *W.C.*

This cowl is made in galvanized iron 30-in. and 54-in. high, and consists of a shaft with a trumpet mouth and hooded top, with four tubes at the sides, with open mouths which collect the passing wind and conduct it down to the base of the cowl, into which it is injected in an upward direction, insuring a constant and powerful up-draught in the shaft itself, and by producing a vacuum necessitates an up-current in the flue. *See Advertisement Appendix*, *page* 116.

Æolus Patent Special Downblow Chimney Cowl.

GENERAL VENTILATING COMPANY, LIMITED, 235, *High Holborn*, *W.C.*

This cowl is stated to be a certain preventive of down-blow, caused by compression of air or rebound from an adjacent higher building. It consists of an ordinary cowl with a trumpet-mouth and hooded top, outside of which is a shield with four air inlets, to create an upward current. *See Advertisement Appendix*, *page* 116.

The "Climax" Smoke-Preventing Chimney Pot.

J. D. Wright, 4, *Lupus Street, S. W.*

This cowl is made in zinc, galvanized iron, and copper. The base or flange is constructed so as to concentrate the whole of the heat in the chimney towards the apex, and thus prevent cold air from passing down. This is accelerated by forming a spiral aperture extended round the whole surface towards the head, which has vertical openings, and divisions between each. The advantages claimed are that it prevents down-draught, and will act at all times.

The "Climax" Ventilator, on the same principle, is made from 2 in. to 30in. in diameter for ventilating soil pipes drains and buildings.

Patent Triumph Smoke Cure.

J. M. Lamb & Co., 119, *Finchley Road, N.W.*

This cowl has a revolving head divided into segments, which collect all the air with which they come into contact in a spiral form, the segment pieces allowing a free exit for the smoke on the off-side. It works noiselessly on a hard cast-steel spindle in a cup of the same material, and cannot be knocked off in sweeping.

Boyle's Patent Chimney Cowls.

R. Boyle & Son, 64, *Holborn Viaduct, E.C.; and* 110, *Bothwell Street, Glasgow.*

A cowl made in galvanized iron serves the double purpose of creating an up-draught and preventing down-draught. It consists of a shaft widening out at the top with louvred openings, over which is a conical top. The smoke strikes against the upper portion of the head and expands, so that a comparative vacuum is thus formed, which sucks up and creates a permanent draught. There are no movable parts, and it is consequently noiseless in operation and easily swept.

A similar cowl is made and intended only to prevent down-draught, where the chimney is in close proximity to higher buildings. It consists of two conical heads in the form of louvres; inside of the upper one is a diaphragm. If the air is forced in the top, it is split up by the diaphragm and deflected over the top of the flue and passes out in the openings between the two coves, which also assists the up-draught. *See Advertisement on Front Cover.*

Cure for Smoky Chimneys.

Kite's Patent Albert Chimney Caps, 17, *Chalton Street, Euston Road, N. W.*

These caps are made in galvanized iron and zinc. The tops are covered to prevent down-draught, and the currents of air being deflected through the outer openings create an upward draught. They are neat in appearance and fixed as an ordinary chimney pot, and offer no obstruction to the sweep's machine in cleaning.

The Webber Smoke Exhauster.

F. Braby & Co., *Euston Road, N. W.*

The method adopted in this cowl is by suspending an Exhauster inside the chimney, by means of which a heated chamber is formed, and the air inside the tube rarefied, the flue, except the tube for the escape of smoke, being covered, keeps the top of the chimney warm, which is necessary for producing an upward current; it serves also to produce increased warmth in the room, and a less consumption of fuel. Ventilation is secured by the wind passing up the inclined cones, carrying off the vitiated air, whether fires are lighted or not.

GLAZIER.

Glazed Roofing.

F. Braby & Co., 356 *to* 362, *Euston Road, N. W.*

This patent system consists of a cast-iron bar of anchor shape secured by iron chairs to purlins of wood or iron. The arms of the anchor are prepared for india-rubber or rope, or other suitable packing, upon which the glass is laid, free, so as to avoid breakage by vibration, expansion, or contraction. A spring clip of zinc, galvanized iron, or copper, forms a cover over each bar. The condensation is carried off by the troughs in rafters. Skylights on this principle can be made in conjunction with zinc roofing, the rolls uniting with the bars.

Causley's Patent Glazing without Putty.

19, *Downs Park Road, West Hackney, N. E.*

This invention consists of a metal gutter with channels to carry off condensation, which is fixed on to a wood or iron rafter; upon this the glass is laid and a metal cap is afterwards put, fixed with galvanized iron or brass screws. By this means the glass is not only made air-tight and water-proof, but free from breakage by variation of temperature. Broken glass can be readily replaced.

Patent Simplex Glazing.

Grover & Co., Limited, *Britannia Works, Wharf Road, City Road, N.*

The object of this system is to do away with putty in greenhouses, skylights, etc., by means of a lead slip nailed to the sash bars, and folded over to allow of the glass resting between two thicknesses of lead. New glass is easily inserted, and by being pressed close, renders roofs wind and water-tight and noiseless in windy weather. The same system can be applied to vertical sashes. *See Advertisement Appendix, page* 117.

Roof Glazing.

The British Patent Glazing Company, 24, *Finsbury Circus, E.C.*

The system adopted by this company is specially intended for roof glazing of all descriptions, and consists of solid rolled malleable iron bars of a light section (which can be made any length), enveloped with light sheet-lead. The glass rests upon a soft metal bed, and is secured by folding the lead over the glass. The shape of the bar provides channels for carrying off moisture, and provision is made for expansion and contraction. Special shoes are made for fixing on to the ridge and sill, into which the top and bottom ends of the bars are fitted. *See Advertisement Appendix, page* 123.

Horticultural Glazing without Putty.

William Parham, *Northgate Works, Bath; and* 280, *Oxford Street, London, W.*

This system consists in using rafters of wrought iron or deal, channelled or guttered on their upper side, to carry off rain or condensed vapour. The glass is lapped at top and bottom, and supported on ribbed cover plates fixed along the rafters with elastic copper springs between the nuts and cover plates to allow for expansion. The rib prevents the entrance of wind. *See Advertisement Appendix, page* 117.

Patent Universal System of Glazing without Putty.

The Pennycott's Glazing and Engineering Company, *Glasgow.*

This system consists of sash bars constructed of sheet zinc, copper or other metal, formed with a double gutter to carry off condensation. In these bars are fixed tongues of lead which are folded over the glass, thereby avoiding putty and the consequent breakage from contraction and expansion. The glass lying perfectly close is proof against wind, rain, dust, and snow. The bars are easily fixed by clips to wood or iron purlins.

Rendle's Patent System of Glazing.

W. E. Rendle, 3, *Westminster Chambers, Victoria Street, S. W.*

The plan adopted is to lay wood laths about two inches square on rafters about six feet apart. On the former are fixed horizontal bars of zinc or copper formed as a kind of hooked rebate; into these the glass is placed by pushing the top as far as it will go, which allows the bottom edge to drop over the clips. The bars are so constructed that all condensed steam or vapour passes through holes to the outside. The squares of glass are lapped vertically or into a metal bar formed as a circular gutter with capping.

Shelley's "Standard" System of Glazing.

Shelley & Co., *Smethwick, Birmingham.*

This method provides a light iron rafter formed with channels to carry off condensed moisture, upon which the glass is supported, but a vulcanite bead prevents it being laid directly on the iron. A loose stop also prevents the glass from being lifted below, and this is kept in position by a zinc or copper capping, fixed by a tightening webbed cotter, thus dispensing with bolts and nuts. By the solidity of this cap it allows a plank to be laid for the purpose of cleaning or repairs.

Cranston's Patent System of Horticultural Building.

W. Parham, *Northgate Works, Bath; and* 280, *Oxford Street, London, W.*

This invention allows of an arched mode of construction which is effective for conservatories, greenhouses, etc. The glass is laid in planes with pierced vertical ventilation plates between them through which the air passes into the house, regulated or shut off at pleasure. The bars are made in two portions, the upper half being screwed into the lower after the glass is put in position, and so doing away with the use of putty. *See Advertisement Appendix, page* 117.

Glazed Wall Cover for Fruit.

MESSENGER & Co., *Loughborough.*

A glass coping or cover, with iron frames supported by iron brackets to a brick wall. Wood sashes are made to enclose the front to run on iron sill, and to remove when desired. It is a good protection for trees from frost, gives ventilation, and ensures the proper ripening of the wood.

Glass Ventilators.

MOORE'S PATENT IMPROVED GLASS VENTILATORS, *Sekforde Works,*
St. James's Walk, Clerkenwell, E.C.

Ventilation is obtained in windows by means of glass louvres fitted into a brass frame regulated at pleasure by a cord and rack. They can be fixed in the ordinary squares of a window or inserted in plate-glass or other large windows by means of a frame fixed therein.

Improved circular and sliding glass ventilators are made in squares of 26-oz. and 32-oz. sheet and polished plate.

Stained Glass.

W. B. SIMPSON & SONS, 100, *St. Martin's Lane, W.C.*

Stained glass for church windows; figure, heraldic, and ornamental work; also for staircase windows. Window blinds, window heads, etc., and plain lead glazings. *See Advertisement Appendix, page* 120.

PAINTER.

Washable Distemper.—Morse's Patent Calcarium.

37 *and* 38, *Great Alie Street, Whitechapel, E.*

This preparation is manufactured in numerous tints, and suitable for distempering walls internally and externally, stucco, rough-cast, brick work, etc. It is laid on as ordinary whiting and distemper, and may be washed without removing the surface.

Silicate Distemper.

GRIFFITHS, BERDOE & Co., 34, *Leadenhall Street, E.C.; and Liverpool.*

A water paint which dries quickly with a hard, washable surface, and specially suitable for hospitals, prisons, etc.; and good for decoration and stencilling. It is mixed with water instead of oil, and applied as ordinary distemper. *See Advertisement Appendix, page* 118.

Stone Liquid Encaustic.

SZERELMERY & Co., 110, *Cannon Street, E.C.*

This material is made in the form of a thick paste, which is diluted by water and laid on as distemper, drying in about twenty-four hours. It is prepared in numerous colours, and adapted for internal decorations, and may be laid on over old oil-paint, distemper, or whitewash.

Asbestos Oil Paints.

UNITED ASBESTOS COMPANY, LIMITED, 161, *Queen Victoria Street, E.C.*

This paint is prepared in many colours, and is laid on as ordinary paint. Besides being fire-resisting the advantages claimed are greater durability than ordinary paints, and power of resisting all deleterious gases and foul atmospheres, and as being non-infectious. *See Advertisement Appendix, page* 118.

Asbestos Patent Fire-Proof Paints.

UNITED ASBESTOS COMPANY, LIMITED, 161, *Queen Victoria Street, E.C.*

This paint contains no oil or inflammable substance, and is recommended as a safe-guard against the spread of fire on underside of floors, staircases, partitions, shelves, etc., as wood so painted will not carry the flames. If this paint is used as a foundation, the work may be finished in the Asbestos Oil Paint. *See Advertisement Appendix, page* 118.

Albissima Paint.

ALBISSIMA PAINT COMPANY, LIMITED, 34, *Lime Street, E.C.*

This is a fine paint of pure white, not affected by the atmosphere or gas. It is non-poisonous, non-smelling, and adapted for admixture with colours to make delicate tints; easy of manipulation and works freely. On account of its preservative qualities (as it does not occasion any galvanic action when exposed to moisture), it is especially useful for metals.

Improved Paints.

GRIFFITHS, BERDOE & CO., 51, *South John Street, Liverpool; and*
34, *Leadenhall Street, London.*

The Sanitary Paint is non-poisonous, covers well, dries quickly; with a hard, durable surface. It is unaffected by extremes of temperature, and does not easily blister. The colours are brilliant, permanent, and quite fast in the light. *See Advertisement Appendix, page* 118.

The Silicate Paint is similar to the foregoing, but prepared with a special kind of silica, which imparts extreme hardness. *See Advertisement Appendix, page* 118.

The Enamel Paint dries quickly with a hard glazed surface. It is non-porous, and especially serviceable for hospital wards, etc., as disease germs cannot lodge in it, and it will bear any amount of washing. *See Advertisement Appendix, page* 118.

Anti-Corrosive Paint.

N. C. SZERELMEY & CO., 110, *Cannon Street, E.C.*

The advantages claimed for this paint are that it resists the action of corrosive acids and alkaline vapours, stands heat and cold, and is impermeable by vapours or atmospheric influences. Being elastic it expands and contracts with metal, and contains nothing injurious to the health of those who use it. It is prepared in a variety of colours and easily laid on.

Magnetic Silicate Oxide of Iron Paint.

H. THOMPSON & Co., 95, *Merrow Street, Walworth Road, S.E.*

This paint is composed of magnetic oxide of iron, which is not attacked by rust acids, or sulphurous gas. The merits claimed are special preservative qualities, a good body, well ground, free from acids and anti-corrosive. It forms a complete coating of magnetic iron, and is impervious to damp.

Balmain's Patent Luminous Paint.

IHLEE & HORNE, 31, *Aldermanbury, E.C.*

This paint absorbs daylight or strong artificial light (gas electric magnesium, etc.), and reflects the same in the dark; it contains no phosphorus, and is stated to possess all the advantages of ordinary oil paint and is equally lasting. It is useful for painting corridors, staircases, etc., and is may be also employed for outdoor numbers, notices, etc., required to show out at night.

Rendle's Patent Paint Remover and Cleaners.

RENDLE BROTHERS, 3, *Westminster Chambers, Victoria Street, S. W.*

The paint remover, the principal ingredient of which is pure soda, removes old paint, varnish, tar, grease, wall paper, etc., from wood, stone, iron, marble, etc., and is applied as a solution; it possesses no offensive smell, and leaves the surface smooth, thus doing away with hot irons, charcoal fires, scrapers, pumicestone, etc. The paint cleaners are prepared in three strengths. The first for ordinary paints, varnishes, etc.; the second for less dirty work; and the third for all kinds of delicate material and work.

Paint Remover and Cleaner.—Protected Alkaline Composition.

WILSON AND CO., *Chemists, Stowmarket.*

This composition is prepared of two strengths; one for taking off old paint and varnish from wood, metal, etc.; the other for cleaning and washing paint, floors, floorcloth, removing wallpaper, old distemper, dirt, or grease, etc. In the former case it is laid on as a composition, and allowed to remain for a time before scraping off; and in the other mixed with water, according to the strength of the work required.

DECORATOR.

Paper Hangings.

COTTERELL BROTHERS, *Clare Street, Bristol.*

This firm manufactures paper hangings of all kinds. Their specialities are in high class designs, with colourings of terra-cotta, salmon maize, and other warm and light tints, as well as olive shades, at an inexpensive rate. They also supply a book of designs for stencil decoration, and cut stencils to order. *See Advertisement Appendix, page* 117.

Paper Hangings.

W. WOOLLAMS & Co., 110, *High Street, Manchester Square, W.*

The papers manufactured by this firm are hand-made and free from arsenic. The embossed flock papers (Anmonier's patent) have designs in relief finished in coloured flocks without painting, if desired. The manufacture also includes embossed imitation leather paper. Damask and tapestry patterns, on plain and mica grounds; dado decorations in various styles, borders, friezes, etc. The designs are of a high class by acknowledged artists. *See Advertisement Appendix, page* 118.

Wall Papers.

W. B. SIMPSON & SONS, 100, *St. Martin's Lane.*

Wall Papers, specially designed by *Lewis F. Day*, also Ceiling Papers, Dados, Friezes, etc. *See Advertisement Appendix, page* 119.

Japanese Leather Papers.

C. HINDLEY & SONS, 290 *to* 294, *Oxford Street, W.*

The papers imported by this firm comprise a large number of embossed leather papers, of various patterns and colours, similar to the stamped leather hangings used in the 15th and 16th centuries. Although manufactured in Japan they are from designs of English as well as Japanese artists.

Japanese Leather Paper.

ROTTMANN, STROME & Co., 49 *and* 51, *St. Mary Axe, E.C.*

These papers are manufactured at Yokohama of a strong fibre, almost untearable, in quantities of about twelve square yards. The designs are based upon the models of the old Spanish embossed leathers, but carried out by Japanese artists. The paper can be cleaned and washed with sponge and soap, and being soaked with a lacquer does not suffer from the effects of gas-light and smoke.

Hand-Painted Paper-Hangings.

SCOTT, CUTHBERTSON & Co., *Whitelands, Chelsea, S.W.*

The special advantages are that colours are more firmly fixed than machine papers. No arsenical colours are used. Raised flocks are intended for painting. This firm manufactures silk damask papers.

Lincrusta Walton.

THE SUNBURY WALL DECORATION, 9, *Berners Street, Oxford Street, W.*

This material is manufactured in the same manner as Linoleum, but with ornamental patterns in low relief, and readily admits of decoration. It is impermeable to moisture, and useful for damp walls, and being a non-conductor of heat gives warmth and comfort. It can be fixed either on a wood framework, or with solution to the plaster walls, and may be scrubbed or washed to any extent. It is especially useful as dados, and also as decoration on panels in furniture, etc.

Wood Decoration.

PLIABLE WOOD DECORATION COMPANY, 1, *Wenlock Basin, City Road, E.C.*

An inexpensive mode of internal decoration, patented by Colonel De la Sala. The method adopted is by cutting veneers very thin, thereby rendered as pliable as leather. They are placed on a substratum of straw board, or other suitable material, and can then be fixed against walls as dados, panelling, etc., or for ceilings.

Wood Carving.

MARTIN'S PATENT WOOD CARVING COMPANY, 338, *Euston Road, N.W.*

By the use of machinery, carvings are produced on all woods at a very moderate cost, suitable for ornamental woodwork, cornices, etc., and for cabinet work of all descriptions.

Patent Metallikon Decorations.

H. HENKINS & Co., 4, *Oxford Street, W.*

This invention consists in the combination of glass, metal and ceramic substances either singly or in combination. The glass is blown in the ordinary manner, or melted, after which pure gold leaf is added. It is suitable for decorations of walls and ceilings, names, facias, signs, and tablets, ornamental tiles, etc. Being unaffected by gas, frost, etc., the colours maintain their brilliancy.

Imperishable Church Decorations.

W. B. SIMPSON & SONS, 100, *St. Martin's Lane, London, W.C.*

Fresco Tiles.—Reproducing in a permanent manner, the effect of the old, dull, Fresco Wall Painting; very valuable for mural decoration where walls are inclined to be damp. Also Mosaics, Figures or Emblems in ceramic or Venetian Glass, with Gold ground for reredoses and Mural Tablets, etc. *See Advertisement Appendix, page* 119.

Venetian Enamel Mosaics.

THE VENICE AND MURANO GLASS AND MOSAIC COMPANY,
30, *St. James's Street, W.*

The glass mosaics are prepared in Venice, and are adapted for mural decoration of halls, dados, corridors, staircases, of houses; also for the ornamentation of churches and public buildings, both internal and external. They combine a durability which in this climate cannot be obtained, either in fresco or surface painting.

Ornamental Glass.—Patent "Glacier" Window Decoration.

PERRY & Co., *Holborn Viaduct, E.C.*

This material is intended to be affixed to glass windows, and being insoluable in water will not crack or rub off in cleaning. The designs are transparent and may be formed into ornamental patterns, borders, etc., in various colours, with black lines between the several pieces, which gives the appearance of lead lines.

Decorated Enamelled Iron.

W. B. SIMPSON & SONS, 100, *St. Martin's Lane, W.C.*

This material, manufactured by the Patent Enamel Company, Birmingham, is specially suitable for permanent decoration of roofs, ceilings, walls, etc. The surface is highly vitrifiable, and the colours being burnt in, withstand the action of smoke and vapour, and can be readily cleaned. It is made in plates of any reasonable size, and is easily fixed. *See Advertisement Appendix, page* 119.

SUNDRIES.

Patent High-pressure Self-cleansing Filters.

J. HALLIDAY & CO., *Water Street, Newtown, Manchester.*

The advantages claimed are that the water passes through the filter under high pressure; it is air-tight, thus preventing the decomposition in the filter of any organic matter; it gives a continuous supply of thoroughly filtered water, and can be easily cleansed. The filters are made in various sizes, and adapted for domestic uses as well as manufacturing purposes. The smallest one can be applied to a ¼-in. pipe, through which water drawn from the tap will pass, or it may be attached to the main, and so all water supplied in a house will be filtered.

Maignen's Patent "Filtre Rapide."

JOHN BELL, 118, *Southwark Street, S.E.*

These filters are made in several forms and varieties for the table and cistern. The construction consists of an inverted cone of Asbestos cloth, upon which is a finely-powdered filtering medium called Carbo Calcis. When the filter requires cleansing, this medium is replaced by a fresh supply, and, as the parts are all movable, no difficulty is experienced in renewal.

Jeyes' Perfect Purifier.

JEYES' SANITARY COMPOUNDS CO., LIMITED, 43, *Cannon Street, E.C.*

This compound being prepared in a concentrated form, is capable of dilution to a considerable extent, according to the purpose for which it is required. It is stated to prevent infection by killing diseases, and also the germ of diseases floating in the atmosphere. It sweetens and purifies the atmosphere, and is useful as a deodoriser in water-closets, sick rooms, stables, etc. Being harmless in use and non-corrosive, it will not injure metal or textile fabrics.

Portable Structures.

PUGGAARD & GALSCHIOT, 50, *Boulevard Haussmann, Paris.*

The invention patented by Mr. Doecher, consists of light wooden frames, covered with felt waterproof and air-tight, and suitable for pavilions, hospital tents, fishing and shooting boxes, and other temporary erections. They are arranged to pack in boxes and are easily put together.

Graigola Merthyr Patent Fuel.

CORY & YEO, *Managing Directors of the Compagnie Houillère de Graigola, Merthyr, Swansea; and* G. WILLCOCKS, 23, *Rood Lane, E.C.*

This fuel is made in blocks from carefully selected clean and fresh wrought South Wales coal, combined with a proportion of bituminous matter. It is hard, and yields a very small percentage of ash, and raises steam with much greater rapidity than coal. It is specially adapted for consumption in manufactories, locomotives, and navigation.

Smokeless Coal.

WAYNE MERTHYR COMPANY, LIMITED, *Aberdare, South Wales; and Bartholomew House, Bartholomew Lane, E.C.*

This coal produces a clear hot fire, free from smoke and clean, leaving little or no ash; will continue alight without attention, and is especially adapted to slow combustion stoves, furnaces, etc.

Household Fire Escape.

A. DISS, *West Bergholt, Colchester.*

This consists of a ladder formed with strong chain enclosed in an iron box or hopper fixed in the outer wall, in which it is drawn when not in use. The underside has a self-closing door, which may instantly be opened by a pull from any floor, allowing the chain ladder to fall, and affording means of egress from each floor. A loud alarm-bell in the box is set in motion by the fall of the ladder.

Patent Chemical Fire Engine.

SHAND, MASON & CO., 75, *Upper Ground Street, S.E.*

This engine is made to sling over the shoulder, and consists of a vessel containing an alkaline solution and an acid which, when in contact, gives off carbonic acid gas; this mixed with water through a hose and jet pipe, proves an efficient liquid for extinguishing fire. A simple method is adopted to produce this result.

Amberg's Patent Self-Index Letter Files.

CAMERON, AMBERG, & CO., 27, *Little Britain, E.C.*

The new "Peerless" letter file consists of a number of leaves alphabetically arranged, each letter distinct, and with a metal fastener at the back, caught and held in place by a slide which runs in a recess in the back of the file, and when the files are full they can be readily transferred into cases specially prepared.

The Cabinet Letter File consists of twenty-four files, enclosed with doors if desired.

Drawing Instruments, etc.

W. F. STANLEY, *Great Turnstile, Holborn, W.C.*
See Advertisement Appendix, page 121.

Manufacturers of drawing instruments, scales, rules, rods, levels, and other instruments in use by architects. *See Advertisement Appendix, page* 120.

Drawing Pens.—Stringer's Registered Drawing Pen.

ELLIOTT BROTHERS, 449, *Strand, W.C.*

In this pen the ordinary screw is dispensed with, the nibs are regulated by means of a screw collar or a slide, and being cut out of one solid pieces the steel ribs do not lose their parallel positions, and are easily set.

Photo-Lithography.

WHITEMAN & BRASS, 235 *and* 236, *High Holborn, W.C.*

This process of photo lithography allows of architects drawings being faithfully reproduced, or if desired, enlarged or reduced in exact proportion; and is largely used in the illustration of works in the building journals, and also for diagrams in the Transactions of several of the learned societies. An unlimited number of copies may be printed.

Lithographed Bills of Quantities, etc.

J. L. ALLDAY, 39, *Colmore Row, Birmingham.*
See Advertisement Appendix, page 120.

The Dalton Time Lock Syndicate.

69, *Coleman Street, E.C.*

These time locks are so arranged that they will exclude anyone from access until a fixed hour has arrived; but will permit the principal to have entrance when he pleases, and if desired, require several persons to co-operate before an entrance is effected. False keys or duplicates have no effect upon the locks. They are useful for entrance-doors to warehouses and business premises, safes, and strong-rooms, wine-cellars, etc.

The Builders' Accident Insurance, Limited.

Mr. E. S. HENSHAW, *Secretary*, 27A, *King Street, Covent Garden, W.C.*

This strictly mutual Company insures employers engaged in the building trade and its branches (including sub-contractors for labour only), against pecuniary liability, resulting in death or otherwise, occurring to any workmen in their employment, whether arising under the Employers' Liability Act, 1880, or under the common law of the country. The premiums are divided into two classes: No. 1, for a fixed amount of weekly wages; No. 2, for an aggregate sum, spread over a period not exceeding one year. *See Advertisement on Front Cover.*

The Employers' Liability Assurance Corporation, Limited.

Mr. S. STANLEY BROWN, *Secretary*, 84 *and* 85, *King William Street, E.C.*

In addition to the business of ordinary accident insurance this Corporation enables employers to protect themselves against the liabilities imposed upon them by the Employers' Liability Act, 1880.

WROTHAM OLD POTTERY.

BRICK AND TILE WORKS.

Three Minutes' Walk from Wrotham Station, L. C. & D. Railway.

JOSEPH WALLS & SONS,

Manufacturers of Machine-made red Bricks, also of Hand-moulded Loam red Bricks and Roofing Tiles of superior quality, and first-class Builders' Sand, red or white. A speciality in the Machine-made Clay Bricks is that they absorb but very little moisture, bind like rock, making them specially suitable for Bridges, Sewerage, and all kinds of heavy Engineering Works.

Quotations and Samples on application.

By Her Majesty's Royal Letters Patent.

AWARDED A FIRST-CLASS CERTIFICATE OF MERIT AT THE CONGRESS OF THE SANITARY INSTITUTE OF GREAT BRITAIN, AT NEWCASTLE, OCTOBER, 1882.

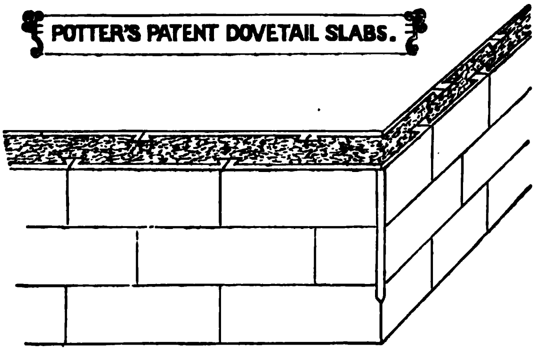
THE "HYGEIAN-ROCK" BUILDING COMPOSITION,

A PREPARATION FOR RENDERING EXISTING WALLS DAMP-PROOF, INCREASING THE STRENGTH OF WALLS, REDUCING THE COST OF WALLS.

Substituting 1-brick Walls for 2-brick Walls; Rendering 1-brick Walls stronger than 2-brick Walls; Constructing Reservoirs and Tanks; Erecting Swimming Baths; Constructing Gas-Holder Tanks; Pickling and other acid-proof Vats; Sea Walls, Dock Walls, &c.

WILLIAM WHITE, 3, Westminster Chambers, Victoria Street, S.W.
GREAT WESTERN WORKS, ABERGAVENNY.

POTTER'S CONCRETE FACING SLABS.


POTTER'S PATENT DOVETAIL SLABS.

THESE concrete facing Slabs are made from specially prepared materials, and of any colour required. They are perfectly damp-proof, and so true and smooth that for many buildings no internal plastering is needed. Being non-absorbent and very hard, their advantages when compared with brick and plastered walls are apparent. Walls built with these Slabs admit of a variety of treatment in themselves, or in conjunction with other substances. They are free from the objections urged against brick and stone as building materials, are economical in cost and easy of application, and afford the means of constructing perfect sanitary walls. The Epsom Town Hall, Buffet and General Offices at the Royal Albert Dock, Wall round New College (opposite Swiss Cottage Station), and many other buildings, have been erected with these Slabs.—Further particulars can be obtained from

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"Quality is the test of Cheapness."

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MESSRS. PILKINGTON & Co. (Established 1838) respectfully invite attention to the following Institutions and Patrons, taken from a long list of esteemed customers, as the best evidence of the high character of their several products—merely adding that their aim has ever been to establish confidence by the uniform excellence of their Asphaltes, rather than to attract custom by the sale of spurious articles at low prices.

Messrs. PILKINGTON & Co. have special pleasure in mentioning, in evidence of the satisfactory way in which they do their work, that among their present patrons are included Architects and Builders by whom they have been employed, from time to time, for a long series of years.

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Stockwell Small Pox Hospital.—Late F. Marable, Esq., Architect.
Stockwell Fever Hospital.—Late T. H. Wyatt, Esq., Architect.
Lord Sefton's Mansion, Croxteth Hall, Liverpool.—Late T. H. Wyatt, Esq., Architect.
Chartam Lunatic Asylum.—Messrs. Giles & Gough, Architects.
Gloucester Lunatic Asylum.—Messrs. Giles & Gough, Architects.
Homerton Union.—Messrs. Giles & Gough, Architects.
Woolwich Union, Plumstead.—Messrs. Church & Rickwood, Architects.
Eye Union, Eye, Suffolk.
National Safe Deposit, London.—John Whichcord, Esq., Architect.
Grand Hotel, Brighton.—John Whichcord, Esq., Architect.
Clarence Hotel, Dover.—John Whichcord, Esq., Architect.
National Provincial Bank, Bristol.—W. Gingle, Esq., Architect.
West of England Bank, Pontypridd.—W. Gingle, Esq., Architect.
West of England Bank, Weston-super-Mare.—W. Gingle, Esq., Architect.
Liverpool & London & Globe Insurance Co., Bristol.—W. Gingle, Esq., Architect.
Royal Sea Bathing Infirmary, Margate.—J. G. Knowles, Esq., Architect.
Army & Navy Stores, Westminster.—J. G. Knowles, Esq., Architect.
County Militia Stores, Devizes.—Henry Weaver, Esq., Architect.
Baron Rothschild's Mansion, Lodge Hill, near Aylesbury.
Lord Derby's Mansion, Holmwood, Kent.—Messrs. Chadwick, Architects.
Marquis of Aylesbury's Estate, Severnake.
Lord Hilton's Estate.
Technical College, Tabernacle Row.—E. N. Clifton, Esq., Architect.
Holborn Viaduct and Farringdon Road Buildings.—E. N. Clifton, Esq., Architect.
Metropolitan Wharf, Wapping.—E. N. Clifton, Esq., Architect.
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⁂ Messrs. PILKINGTON & Co. *will be happy to forward, on application, Specimens, with Prices, of their various Products.*

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London Felt Works,

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MANUFACTURERS OF

1d. per Square Foot. { **ASPHALTED ROOFING FELT** / **INODOROUS BITUMEN FELT** } 1d. per Square Foot.

HAIR FELT for Covering Steam Boilers, Pipes, &c., in long lengths, 3 feet wide or in sheets, 84 by 20 inches.

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FOR FOUNDATION WALLS, TO PREVENT DAMP FROM RISING.

CHAMBERS, MONNERY & Co.

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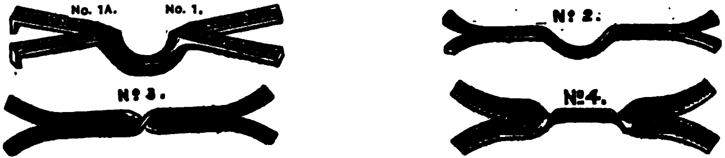
Wholesale & Export Ironmongers, Marble & Slate Merchants, &c.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OUR REGISTERED CAST WALL TIES.

No. 1 Cast-iron 14/- per cwt. No. 1A. same price.
No. 2 Wrot.-iron 19/6 pef cwt. (If galvanized 7/- cwt. extra. If turned-down points, as 1A. 2/-)
No. 3 Wrought-iron 20/- per cwt. No. 4 Wrought-iron 23/- per cwt.

J. STIFF & SONS,

MANUFACTURERS OF

ARCHITECTURAL TERRA-COTTA,

Cornices, Capitals, Strings, Vases, Pediment and Spandril Filling, Balustrades, Trusses, &c.

DRAIN AND SINK TRAPS, KITCHEN SINKS, CLOSET PANS,

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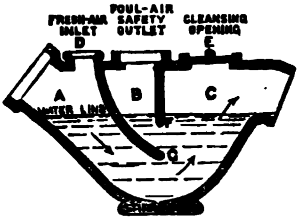
STIFF'S SEWER-AIR EXCLUDING TRAPS.

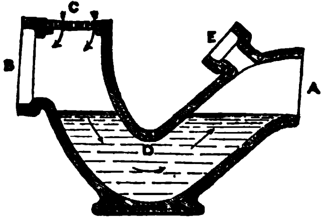
Stiff's "INTERCEPTOR" and "WEAVER" SEWER-AIR TRAPS afford perfect VENTILATION of the HOUSE-DRAIN, as well as a STRONG and EFFECTIVE WATER SEAL against the entrance of FOUL-AIR from the STREET SEWER or CESSPOOL.

Stiff's "WEATHERLY" SINK and WASTE-WATER TRAP effectually TRAPS and DISCONNECTS all Sink, Bath, and Cistern Waste Pipes from the HOUSE DRAIN and SEWER. It conceals discharge of waste-water.; forms an easily-cleaned Grease-Trap and Open Yard Gully.

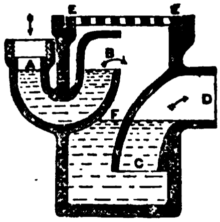
Stiff's "INTERCEPTOR" Trap.



"WEAVER" Ventilating Trap.



"WEATHERLY" Sink Trap.



The "WEAVER" and "WEATHERLY" TRAPS received AWARDS OF MERIT at the INTERNATIONAL MEDICAL AND SANITARY EXHIBITION, LONDON, 1881. The JUDGES being W. H. CORFIELD, ESQ., M.D.; WM. EASSIE, ESQ., C.E.; ROGERS FIELD, ESQ., M.I.C.E.; R. THORNE THORNE, ESQ., M.B. (Local Government Board); and ERNEST TURNER, ESQ., F.R.I.B.A.

Prices—"INTERCEPTOR" TRAPS, 6-in., 16s.; 9-in., 32s. each. "WEAVER" TRAPS, 4-in., 6s. 6d.,; 6-in., 9s.; 9-in., 15s. each. "WEATHERLY" TRAPS (including Iron Grating), 4-in., 12s. 6d.; 6-in., 25s. each.

From *The Builder*, March 25, 1882.—"For excellence of firing and sharpness of modelling, the Architectural Terra Cotta exhibited by Messrs. Stiff & Sons includes some of the best work which we have ever seen in this line."

For Descriptive Price List and Testimonials of efficiency, also for Illustrated Lists of other Sanitary Appliances, Kitchen Sinks, Damp-Proof Course, Red and Buff Architectural Terra-Cotta, Chimney-Tops, Vases, &c.,

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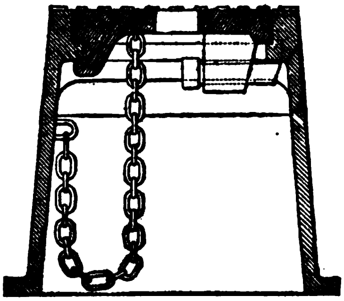

BATTEN'S
PATENT
MAN-HOLE COVERS
AND VENTILATORS FOR SEWERS.

The Advantages are:

That thorough Ventilation of the Sewers is secured.

That the refuse that may enter the Ventilator is easily and quickly removed.

That free access is given to the sewers for flushing und other purposes.

That, as the entry of solid matter into the sewer is entirely prevented, the stoppage of the sewer is also prevented, and the dangerous results of the decomposition of such matter in the sewers rendered impossible.

The dirt boxes are emptied by one man with a small scraper, without removing the lid of the Man-hole Cover, or Ventilator, which is only required when inspection of the sewer is necessary.

The dirt boxes being fixed, they **require no repairs and cannot be lost or forgotten to be replaced.**

The old system of removable dirt boxes, or catch pans, which require two or three men merely to empty the *detritus*, are entirely done away with.

The whole of this unnecessary labour is obviated by using the patent Man-hole Covers and Ventilators, thereby saving the cost of the extra men's time.

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150, LOZELL'S ROAD, BIRMINGHAM.

GEORGE JENNINGS,
SANITARY ENGINEER,
PALACE WHARF, STANGATE, LONDON, S.E.

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Bath Fittings, "Tip-up" Lavatories, Water Closets, Urinals, Sinks, Latrines, Pumps, Hydrants, Sluice Valves, Stand Posts, Fire Cocks, Drinking Fountains, Tidal Valves, and Water Fittings of every description.

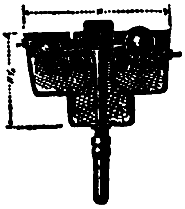
Improved Electric Bells and Speaking Tubes, Drain Pipes, Air and Bonding Bricks, Damp Proof Course, &c., &c.

TERRA COTTA FOR DECORATIVE PURPOSES.

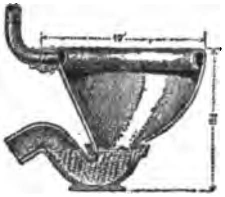
OMER D. WARD,

SANITARY ENGINEER, &c.,

182 & 183, UPPER THAMES STREET, E.C.
WORKS—LITTLE GUILDFORD STREET, SOUTHWARK.



Bean's Valveless W.W.P.
Price, 2 Gal. 30/-.



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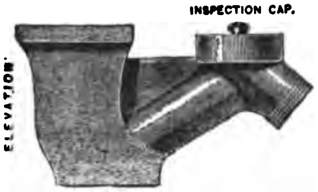
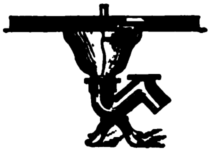
Best, 18/6. Second, 15/-.

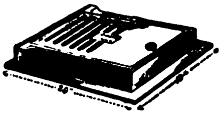
Improved Disc Pattern.



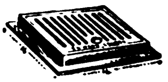
Bean's Patent Gully.



Hospital Slop Sink.



19/-.



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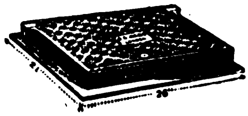
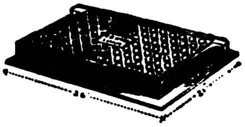
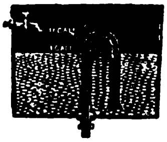


20/6.



22/6.

Man-hole Doors.



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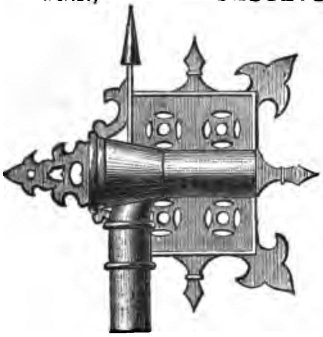
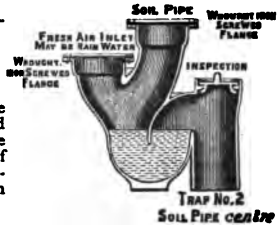
VENTILATORS, SOIL-PIPE TRAPS, WATER-CLOSETS, AIR-TIGHT COVERS, Etc.

HIGHEST AWARDS, EASTBOURNE AND BRIGHTON, 1881; SUNDERLAND, 1882.



BANNER'S PATENT VENTILATING COWL AND TRAP.


Soil Pipe
Wrought iron Screwed Flange
Fresh Air Inlet May be Rain Water
Wrought iron Screwed Flange
Inspection
Trap No.2
Soil Pipe centre

No house should be without one of the latter in the basement, and one of the former on the soil-pipe carried above the highest part of the roof, with a PROPER INLET for fresh air above trap in the basement.

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"There is no metal to corrode, and the basin is hermetically sealed by a water groove. It is one of the cleanest and simplest closets manufactured."—*Building News*, 10*th August*, 1883.

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"We have examined a very simply constructed and economical cover for man-holes for sewers or drains, which has been designed by Messrs. Banner Brothers & Co. The Banner Cover is at once air-tight, secure against the passage of gas, and can be easily removed. An additional advantage of this cover over all others we have inspected is that the joint is perfectly safe without the use of cement. In some forms of cover an **india rubber band** of round section is introduced at the joint, which is liable to get brittle or decay. Messrs. Banner Brothers & Co. have overcome this **serious defect.**"—*Building News*, *August* 10*th*, 1883.

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20,000 IN USE.

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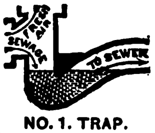
WITH ACCESS OPENINGS,

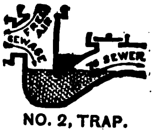
SIMPLEST and MOST EFFICIENT in Market.

HIGHEST AWARDS.

At London, Glasgow, Exeter, Newcastle.



NO. 1. TRAP.



NO. 2, TRAP.

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J. & M. CRAIG, KILMARNOCK, N.B.

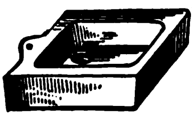
MANUFACTURERS ALSO OF

WHITE ENAMELLED SCULLERY SINKS,

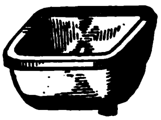
Slop Sinks, Washing Tubs, Hospital Closet-Troughs,

White and Coloured GLAZED BRICKS,

Besides all the ordinary kinds of Fire Clay Goods from Clay of unrivalled quantity.



SCULLERY SINK, No. 1.



SCULLERY SINK, No. 3.

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Specially adapted for STREET WORK, being particularly hard and durable,

PAVING, EDGING, KERBING, CROSSING, CHANNELLING, &c.

As supplied to the Sanitary Authorities and Local Boards of

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Of good Blue Colour, very effective for House Fronts, Warehouses, etc.

Polled Stone, Plinths, Columns, Archways, Copings, Steps, Landers, Troughs, Floors, etc., etc.

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Quotations given for Monuments to any Design.—Company's own Railway Waggons Loaded in the Quarry.—Special Railway Rates.

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Answers to the description required for the best Building Stone, viz., it is "a crystalline limestone of uniform tint, homogeneous in structure, and is converted to building purposes with facility and economy."

Price at Quarry (Blocks of large average), 10d. per foot Cube. Railway Siding on the Works.

THE HAM HILL QUARRIES ARE NOW WORKED BY STEAM POWER.

The best GREY or YELLOW BED STONE supplied promptly.

List of delivered prices of both Stones, worked and in blocks, forwarded on application to

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STONE BROTHERS,

BATH STONE MERCHANTS,

Supply direct from their own Quarries the following Descriptions of BATH STONE:

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Estimates given for Stone prepared ready for fixing.

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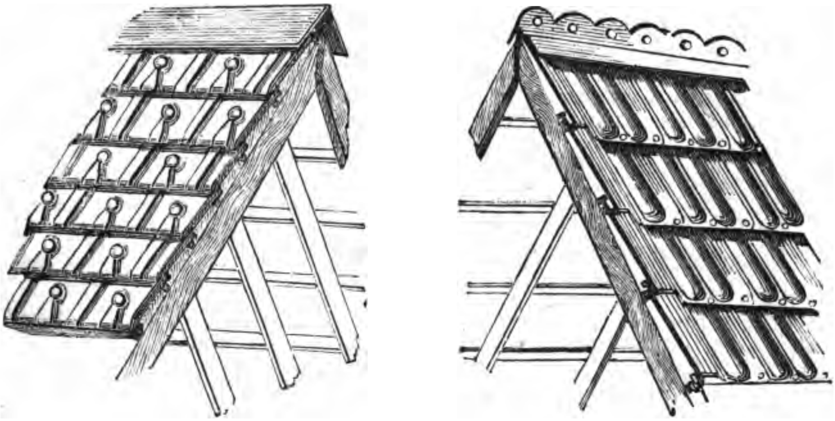
PATENT

LOCK-JAW TILES



FORM THE MOST

PICTURESQUE,

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WATERPROOF

ROOF KNOWN.

PERFECTLY WIND, SNOW, and RAIN PROOF.

Send for full particulars to the Patentees,

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NEWPORT, MON.

HITCHINS' PATENT PLASTERING.

ARCHITECTS, before specifying for Plastering, send for particulars of Hitchins' Improved Systems for resisting Fire, Damp, and staying the Transmission of Heat, Cold, and Sound.

ST. MARK'S PLACE, SANDRINGHAM ROAD,
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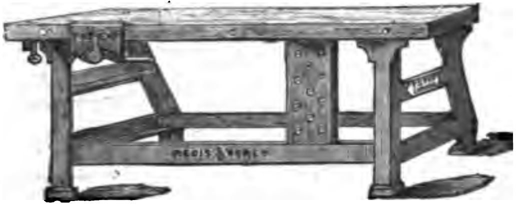
THOS. J. SYER'S

Specialities in WORK BENCHES for PATTERN MAKERS or JOINERS

Have Metal Standards, and, being quite portable, can be taken in parts and packed in a space of 13 in. deep



PATENT VICES (as shown on Bench)	18/-
AMATEUR DITTO	15/-
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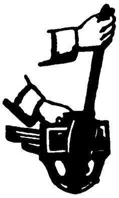

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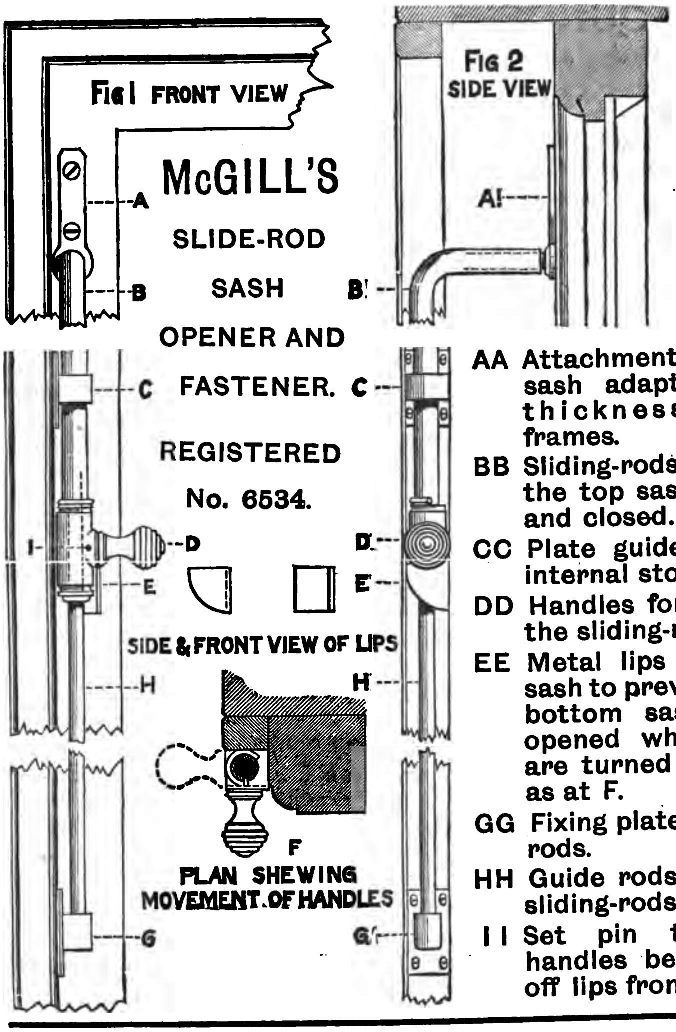

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REGISTERED
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AA	Attachments to upper sash adapted to any thickness of sash frames.
BB	Sliding-rods by which the top sash is opened and closed.
CC	Plate guides fixed to internal stop beads.
DD	Handles for actuating the sliding-rods.
EE	Metal lips on bottom sash to prevent top and bottom sashes being opened when handles are turned over them as at F.
GG	Fixing plates for guide rods.
HH	Guide rods working in sliding-rods.
I I	Set pin to prevent handles being thrown off lips from outside.

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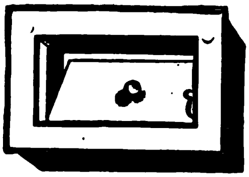

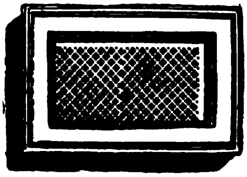

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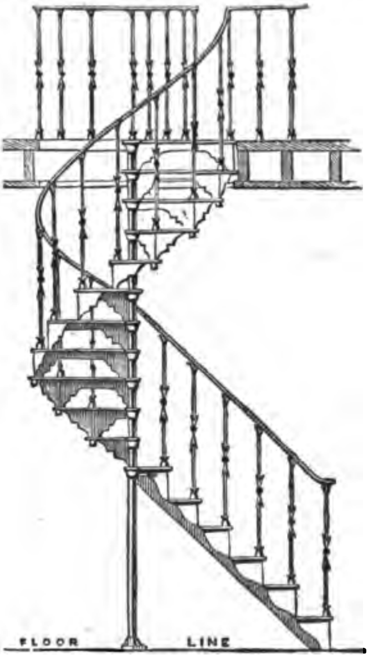

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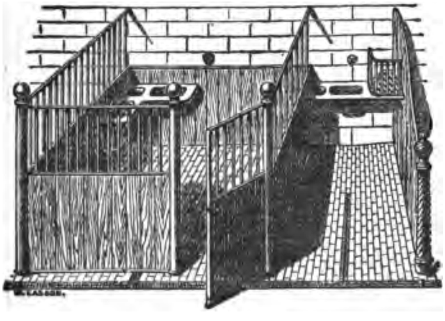

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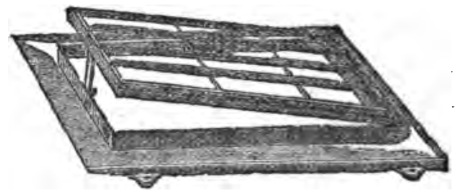

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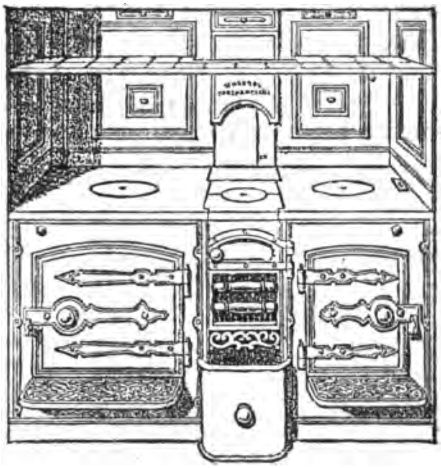

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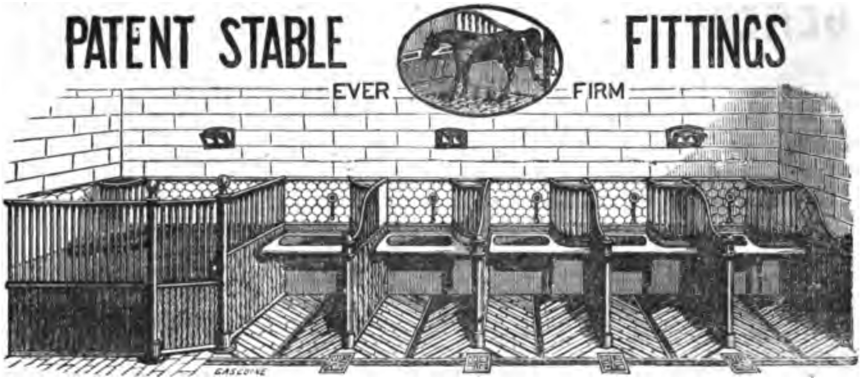

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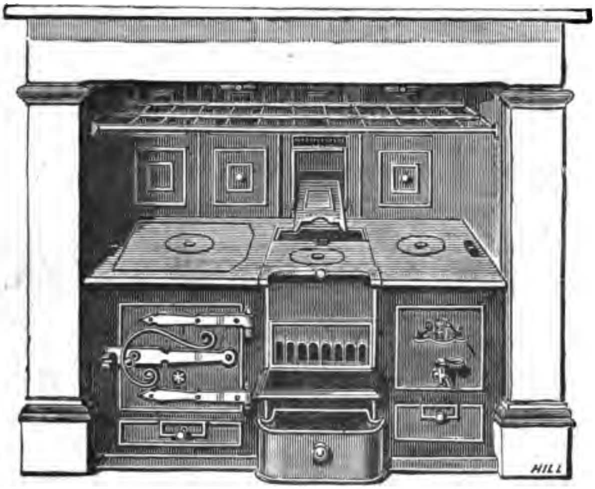

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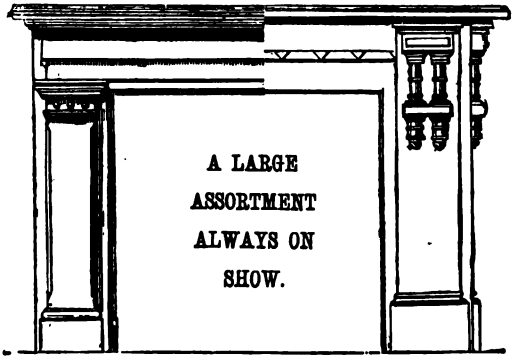

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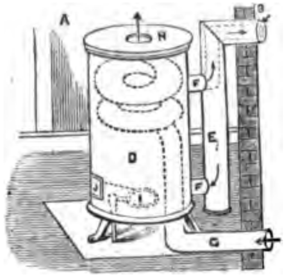

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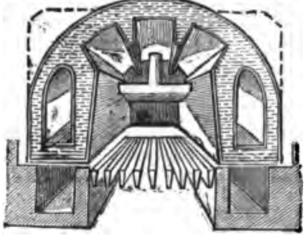

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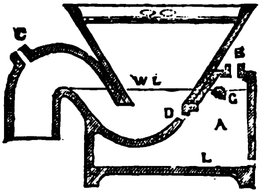

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Fig. $\frac{0}{2}$

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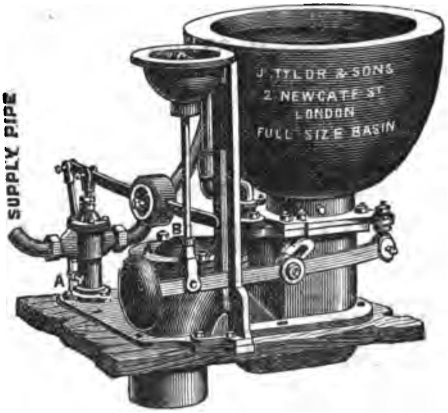

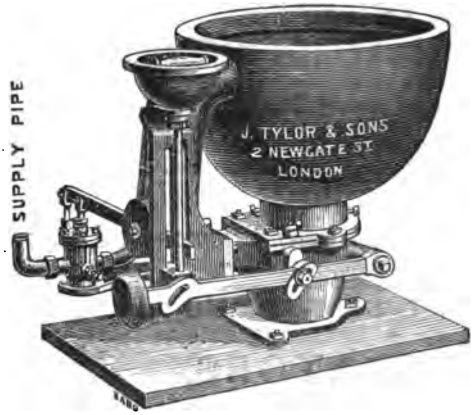

Fig. $\frac{1}{2}$

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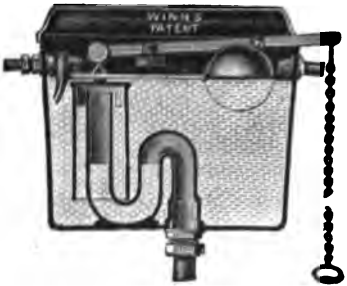

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By pulling the Lever, the Cap is raised and the Syphon is charged. The Lever may now be released, as the Water continues to run till the Cistern is empty, the velocity of the flush *increasing* to the end of the discharge.

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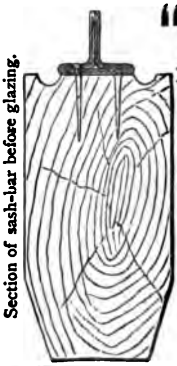

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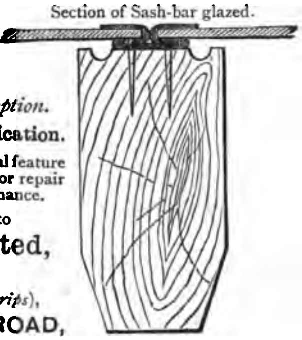

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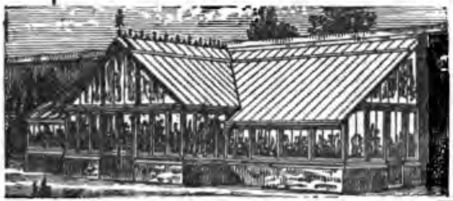

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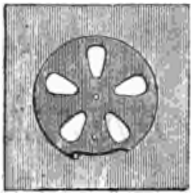

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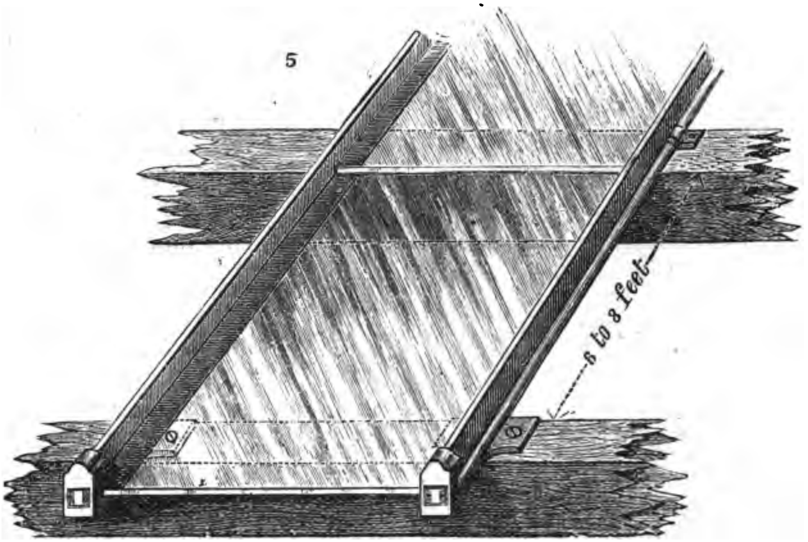

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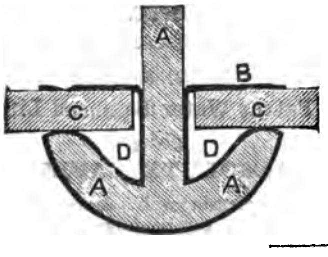

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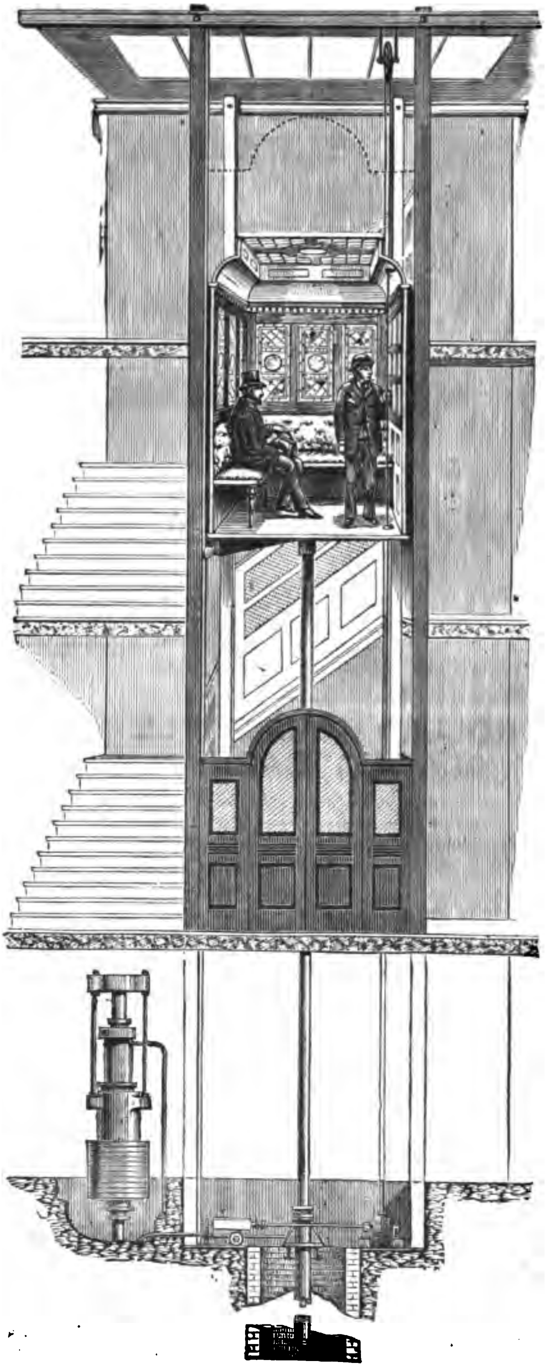

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With automatic Break. Load cannot run down.

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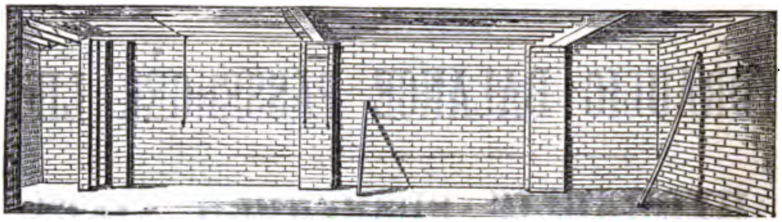
PATENTEE AND MANUFACTURER OF THE IMPROVED

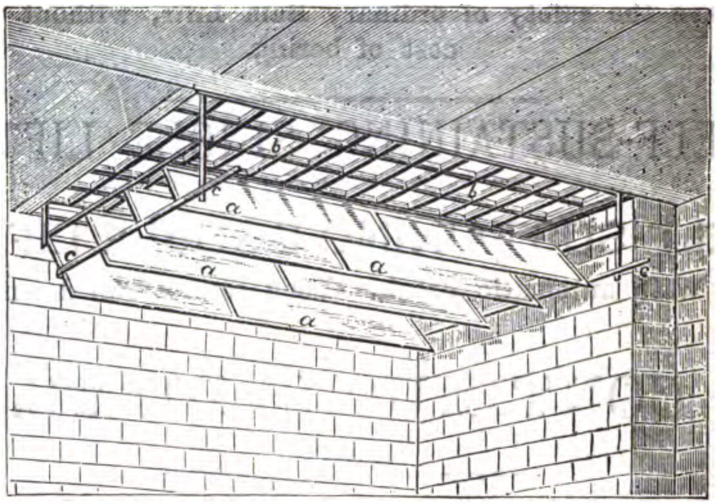
REFLECTING PAVEMENT LIGHTS.



The spécialité of this Pavement Light is a series of silvered glass reflectors (*a a a*) affixed to the underside of the glazed grating (*b*), hung on centres and made adjustable, so that the angle of reflection can be suited to the position in which the light is fixed.

By means of suspending irons the reflectors are fixed at a level that will clear the arch or lintel across opening, which in so many cases renders the old pattern "lens" lights completely useless.

The Builder, April 14th, 1883, writes :—"This invention is the outcome of an attempt to supply a want which the inventor had experienced, and, as a practical builder, he has been able to meet the want in a very simple way." The lights can be seen fixed at 47, Old Street, and at many important buildings in the City, where they have been used by directions of leading architects.



PERSPECTIVE VIEW.—*Explanation.*—(*a*) Silvered fluted reflectors of different depths. (*b*) Strong glazed grating. (*c*) Hanging irons, and adjusting quadrants.

ILLUSTRATED PROSPECTUS AND PRICE LIST ON APPLICATION TO

W. BRASS, Junr., 47, Old Street, St. Luke's, London, E.C.,

Patentee and Manufacturer of the Improved Reflecting Pavement Lights.

R. ADAMS, General Engineer,

Inventor, Patentee, and Sole Manufacturer of the

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Adopted by Government, the principal Architects, Railway Companies, Banks, &c.

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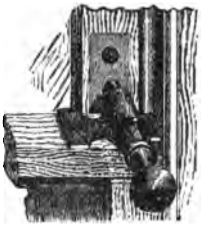
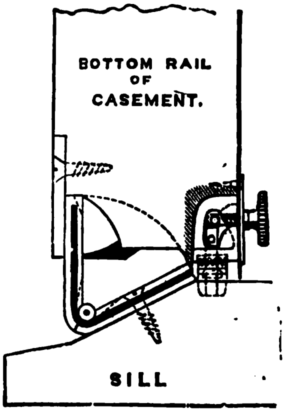
NO RISK NO CORDS NO LONG ARMS OR STEPS REQUIRED

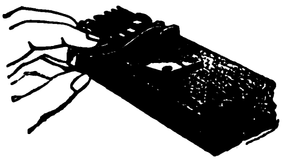
THE TOBY CORD HOLDER.



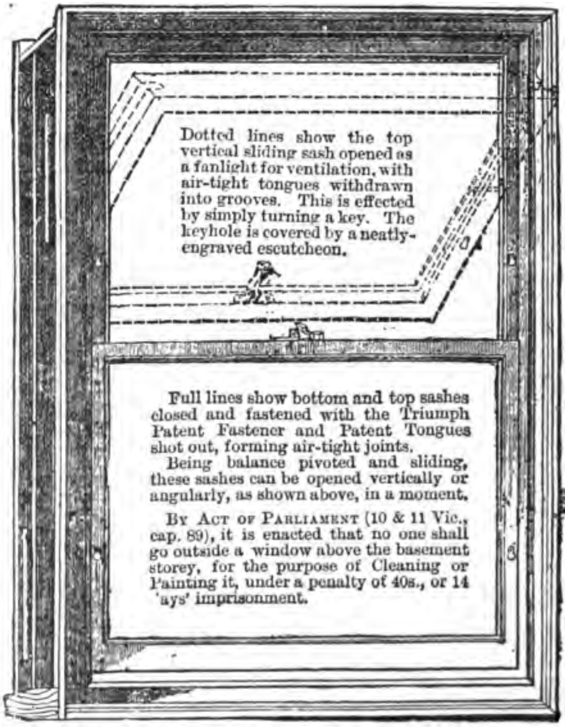
SASH BOLT.



WATER BAR.



TRIUMPH SASH FASTENER.



Dotted lines show the top vertical sliding sash opened as a fanlight for ventilation, with air-tight tongues withdrawn into grooves. This is effected by simply turning a key. The keyhole is covered by a neatly-engraved escutcheon.

Full lines show bottom and top sashes closed and fastened with the Triumph Patent Fastener and Patent Tongues shot out, forming air-tight joints.

Being balance pivoted and sliding, these sashes can be opened vertically or angularly, as shown above, in a moment.

BY ACT OF PARLIAMENT (10 & 11 Vic., cap. 89), it is enacted that no one shall go outside a window above the basement storey, for the purpose of Cleaning or Painting it, under a penalty of 40s., or 14 days' imprisonment.

Both sashes can be raised to the top together, in this manne to admit cumberou goods.

As both sashes slide up and down, and also turn on pivots, they may be placed near the transom to admit cumbrous furniture, or lowered and turned outside in, or uppermost, as shown, for cleaning.

INSTRUCTIONS.
Release the fastener, turn the key, and the window will open (as shown; or close the windows, turn the key, and the tongue will make it air-tight

Note the pleasure, ease and safety here shown in cleaning outside top sash from inside room.

This is the outside top sash cleaned from inside